FINAL ENVIRONMENTAL IMPACT STATEMENT

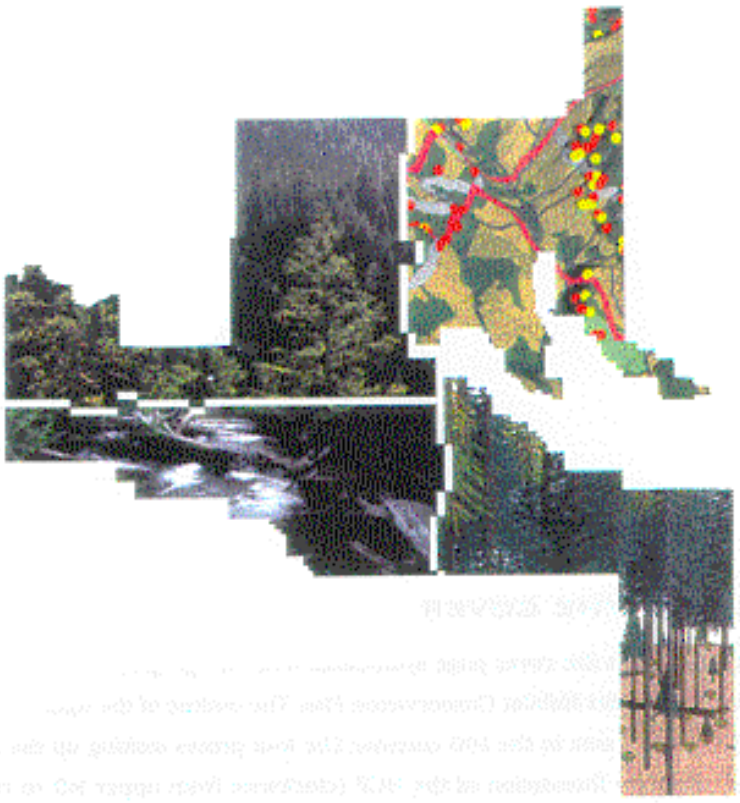
for the Proposed Issuance of a Permit to Allow Incidental Take of Threatened and Endangered Species

Plum Creek Timber Company, L.P.
Lands in the I-90 Corridor
King and Kittitas Counties, Washington

Prepared for: U.S. Department of the Interior
Fish and Wildlife Service

U.S. Department of Commerce
National Marine Fisheries Service

Prepared by: Raedeke Associates, Inc.
5711 NE 63rd Street
Seattle, Washington 98115



March, 1996

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Pacific Coast Ecoregion
Office of the Assistant Regional Director
3773 Martin Way E., Bldg. C, Suite 101
Olympia, Washington 98501

Dear Interested Agency or Individual:

Enclosed for your review is a copy of the Final Environmental Impact Statement (FEIS) on the proposed incidental take permit and Habitat Conservation Plan (HCP) for Plum Creek Timber Company.

In the development of this FEIS, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service (Services) have initiated action to ensure compliance with the purpose and intent of the National Environmental Policy Act of 1969, as amended. Scoping was completed and a Draft Environmental Impact Statement was prepared and released to the public with the comment period ending on January 22, 1996. Based on comments received, modifications were made to the documents and this FEIS was prepared.

The FEIS addresses Plum Creek's proposed HCP. The four alternatives subjected to detailed analysis were (A) the proposed HCP, (B) a No Action Alternative, (C) an alternate HCP based upon only riparian protection, and (D) an alternate HCP based upon a combination of riparian protection and additional dispersal habitat for the northern spotted owl. Alternative A is the Services' preferred alternative.

Key issues addressed in this FEIS are identified as the effects that implementation of various alternatives would have upon (1) threatened and endangered species and their habitats, (2) other wildlife and their habitats, (3) physical environmental factors, and (4) the local and regional impacts to other elements of the human environment.

The FEIS will be available for review until May 13, 1996. For additional information, please contact William Vogel, Project Leader, U.S. Fish and Wildlife Service, 3704 Griffin Lane SE, Suite 102, Olympia, Washington, 98501.

Sincerely,

Curt Smitch
Assistant Regional Director

CS:wv:ef

Enclosure

FINAL ENVIRONMENTAL IMPACT STATEMENT

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Plum Creek Timber Company, L.P.
Lands in the I-90 Corridor
King and Kittitas Counties, Washington

Prepared for:

U.S. Department of Interior
Fish and Wildlife Service
3773 Martin Way East
Building C, Suite 101
Olympia, Washington 98501

and

U.S. Department of Commerce
National Marine Fisheries Service
3773 Martin Way East
Building C, Suite 101
Olympia, Washington 98501

Prepared by:

Raedeke Associates, Inc.
5711 NE 63rd Street
Seattle, Washington 98115

March 1996

COVER SHEET

Title of Proposed Action:	Issuance of a Permit for Incidental Take of Federally-Listed Species and Implementation of the Plum Creek Timber Company, L.P., Habitat Conservation Plan for the Northern Spotted Owl, Marbled Murrelet, Grizzly Bear, Gray Wolf, and other species.	
Responsible Officials:	Mr. Thomas J. Dwyer Deputy Regional Director U.S. Fish and Wildlife Service 911 NE 11th Avenue Portland, OR 97232 NE	Mr. William Stelle, Jr. Regional Director National Marine Fisheries Service 7600 Sand Pt . Way Seattle, WA 98115
Contact:	Mr. William O. Vogel Landino Habitat Conservation Plan Program U.S. Fish and Wildlife Service 3773 Martin Way East Building C, Suite 101 Olympia, WA 98501 (360) 534-9330	Mr. Steven W. Habitat Branch, National Marine Fisheries Service 3773 Martin Way East Building C, Suite 101 Olympia, WA 98501 (360) 534-9330
Legal Mandate:	Endangered Species Act of 1973, as amended, Section 10(a), as implemented by CFR 17.22(b)(1) & 17.32(b)(1)	
Location of Proposed Action:	Plum Creek Timber Company, L.P. Yakima and Puget Sound Management Units	
Applicant Name:	Plum Creek Timber Company, L.P. 999 Third Avenue, Suite 2300 Seattle, Washington 98104 Contact: Mr. Michael E. Collins (206) 467-3600	
Prepared by:	Raedeke Associates, Inc. 5711 NE 63rd Street Seattle, Washington 98115 Contact: Dr. Steven T. White (206) 525-8122	

Abstract

The U.S. Fish and Wildlife Service and the National Marine Fisheries Service propose to accept the Habitat Conservation Plan (HCP) prepared by Plum Creek Timber Company, L.P., and to issue a 100-year, two-phased Permit under section 10(a)(1)(B) of the Endangered Species Act to permit the incidental take of four listed species; northern spotted owl, marbled murrelet, grizzly bear, and the gray wolf (Proposed Action), and certain other unlisted vertebrate species that have been addressed by the HCP. If any of these species become listed, procedures for amending the Permit to include them are addressed in the Implementation Agreement. During the first 50-year phase of the Permit, the Services would authorize Plum Creek to incidentally take certain Permit Species and Plan Species if listed during which the HCP, Permit, and Implementation Agreement run concurrently unless terminated sooner under Section 11.0 of the Implementation Agreement. The HCP has addressed, the Permit provides, and the Implementation Agreement implements, additional but limited incidental take authorization during the second 50-year phase of the Permit. In accordance with such authorization, Plum Creek would be allowed to incidentally take certain Permit Species and Plan Species only to the extent that habitat conditions for any such species exceed the baseline habitat conditions set forth in Section 5.3.3 of the HCP on lands within the Planning Area, subject to conditions and criteria set forth in Section 12.0 of the Implementation Agreement. During the second phase of the Permit, if established, the Permit, Section 5.3.3 of the HCP, and Sections 7.0 and 8.0, and Sections 11.0 through 16.0 of the Implementation Agreement remain in effect.

Plum Creek's HCP includes Company lands on both sides of the I-90 Corridor in the central Cascade Mountains of Washington State about 100 miles east of Seattle. The Planning Area includes both Plum Creek and National Forest lands in "checkerboard" ownership. The HCP examines the affected environment including resident species in the Planning Area and examines the environmental consequences of four alternatives: (1) No-Action; (2) Proposed Plan (the Preferred Alternative); (3) Riparian Management Alternative; and (4) Dispersal Alternative. The No-Action Alternative would continue forest harvest and management activities under current Federal and State regulations. While there would be no incidental take of owls, owl habitat and populations would decline on Plum Creek's land and owl distribution would become isolated. Concurrently, owl habitat (NRF and/or FD) would increase on adjacent National Forest lands. It is assumed that owl populations would depend more upon National Forest lands for appropriate nesting/roosting/foraging (NRF) habitat. Under the Proposed Plan, NRF habitat would decline on Plum Creek's land while foraging/dispersal (FD) habitat would increase. Under the Riparian Alternative, owl habitat in riparian corridors would be protected, but all upland forest would be harvested when commercially appropriate. Under the Dispersal Alternative owl habitat in riparian corridors would be protected. In addition, some upland dispersal habitat would be retained to protect foraging and

dispersing owls. The Proposed Plan may result in the incidental take of approximately 50 owl sites during the first Phase of the Permit. Population simulations indicate that the population of spotted owls would change from a 1995 level of approximately 87 pairs in the Planning Area to 80 pairs for the Proposed Plan, 88 for the No-Action Alternative, 80 for the Riparian Alternative, and 79 for the Dispersal Alternative in year 2045. Minimal or few impacts are expected for marbled murrelet, grizzly bear, and gray wolf under any of the alternatives. Other species may be affected but their populations are expected to remain viable and proposed timber harvests should not contribute substantially to the need to list any of these species.

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SECTION 1.0

CONTEXT

CONTEXT

History of the Project

The Fish and Wildlife Service (FWS), the National Marine Fisheries Service (NMFS) (together known as the Services), and the Applicant (Plum Creek Timber Company, L.P.) began work on the Habitat Conservation Plan (HCP) in early 1994. The Applicant had already begun to accumulate information and initiate investigations to address issues that would be related to the HCP. The Services and Washington Department of Fish and Wildlife (WDFW) provided general advice on how an HCP should be approached and what levels of conservation might be appropriate given the status of various species, the current condition of the landscape involved, and projections into the future. During this initial period, Services' and WDFW staff participated in meetings and several site inspections.

The Applicant initiated peer review of a number of Technical Reports that described the Company's attempts at data accumulation, surveys, research, and assessments of situations such as limiting factors. Peer review comments were solicited from more than 50 scientists, including individuals from government agencies (State and Federal), Tribes, industry, universities, and private consulting firms. Services' personnel not only reviewed and approved the lists of peer reviewers for each Technical Report, but also reviewed each of these Technical Reports.

As alternatives developed, the Applicant chose to share those concepts with interested environmental groups. A number of helicopter and van tours were held in the Planning Area and participants included more than 30 prominent members of environmental groups. The Applicant conducted a series of public meetings to inform the public of the HCP planning process and to receive comment. These public meetings were held in Issaquah (July 14, 1994; 2 sessions); Bellevue (November 15, 1994); and Ellensburg (November 16, 1994). Written comments were received following those meetings. The Services and the Applicant also met with a number of prominent members of local environmental groups throughout the year. As the project developed further, the Services announced the formal scoping period.

Scoping was held over a 30-day period from February 8 to March 10, 1995. On February 8, 1995, the Services published a notice of intent to prepare an environmental impact statement (EIS) and announcement of meetings in the Federal Register (60 FR 7577). Over 60 scoping notices were mailed requesting public comment and providing information on the background and purpose of the Proposed Plan, as well as providing information about the public scoping workshop. Press announcements were presented to local media services.

On February 22, a scoping workshop was held in Bellevue. On March 6, a second Federal Register (60 FR 12248) notice was published announcing a second scoping workshop. On March 8, the second scoping workshop was held in Cle Elum. The scoping comment period closed on March 10. Attendance at the workshops varied from 3 to 11 individuals; with a total of 14 individuals attending meetings during the scoping period. In addition to comments received at the workshops, 9 written comments were received during the scoping period, and 6 written comments were received prior to the scoping period. All 15 written comments and the comments presented at the workshops were summarized in a scoping report prepared by the Services in May 1995.

The Applicant and the Services continued to develop and refine the HCP, and eventually initiated discussion regarding the Implementation Agreement (IA). EIS preparation by the Services and their contractor, Raedeke Associates, Inc., followed the preparation of the HCP. The Applicant held several additional meetings (with Services' personnel in attendance) to inform environmental groups of the progress being made and to receive their feedback. On March 14, 1995, the Applicant briefed the Snoqualmie Pass Adaptive Management Area (SPAMA) Plan Team on the progress of HCP development. A similar meeting was held later in June to clarify strategies and answer questions. Later that month (June 11, 1995), the Services and the Applicant addressed about a 60-member panel of the Keystone National Policy Dialogue on Ecosystem Management (Keystone Science and Public Policy Program) during a bus tour of the Planning Area.

The Applicant and the Services worked closely in preparation of the HCP. Interim drafts were also reviewed by the WDFW. Upon completion of draft documents, distribution to interested parties was initiated by the Applicant and a Federal Register notice was submitted by the FWS and published on November 17, 1995 (60 FR 57722) which announced the availability of the DEIS and draft HCP. An additional Federal Register notice was published by the EPA announcing the availability of the DEIS on November 24, 1995 (60 FR 58086; EIS No. 950538). The release of these documents was accompanied by a news release and articles in several area newspapers (e.g., front page of the Tacoma News Tribune, October 30, 1995). The comment period was scheduled to close on January 8, 1996; however, on January 4, 1996 (January 17, 1996; 61 FR 1193) the comment period was extended until January 22, 1996.

During the comment period more than 180 copies of the DEIS and HCP were distributed to interested parties and agencies and an additional 230 copies of the combined Executive Summary for the HCP and the EIS were also distributed. Although not a part of the application package or the NEPA document, 13 complete sets of Technical Reports, which presented additional information in support of the HCP, were made available for public review. Individual Technical Reports were available directly from the applicant upon request. In total, 25 full sets and 170 individual copies of Technical Reports were distributed. All of these documents were placed in local and regional libraries as announced in the Federal Register.

In addition, during the public comment period, the Applicant and a representative from the Services conducted 12 HCP briefings for State and Federal agencies, Tribes, environmental organizations, and industry groups. In response to this expansive public outreach effort, the Services received an unprecedented number of comments regarding an HCP. During the comment period, the Services received comments from the Environmental Protection Agency, the Wenatchee National Forest, Washington Department of Fish and Wildlife, six members of the State House of Representatives, one professor at the College of Forest Resources (University of Washington), eight letters from five Tribes and Tribal organizations, two national conservation organizations, eight State environmental organizations, 17 local organizations (one of which contained a petition signed by 82 people), two industry organizations, and the Yakima Basin Joint Board. The Services also received 118 letters from 122 individuals. A number of the responses were identical to other letters received (i.e., one identical letter was used by 24 people, another by eight people, and a third was used by three people). In addition, pre-printed cards which were distributed in an environmental group's newsletter were used by 477 individuals (424 cards) as a vehicle by which to comment. A large number of the other comments received in letter form also repeated the same bullets listed on the preprinted cards. A list of the commentors, a more detailed summary of the comments by topic, and the response of the Services to each of those comment topics is presented in Appendix 2. In total, the Services received comment from 737 people and organizations.

Relationship to Other Documents and Necessary Decisions

This FEIS is being written to amend the DEIS in response to public comment and to incorporate additional information, corrections, and changes. As such, this FEIS hereby incorporates the DEIS by reference. All portions of the DEIS should be considered valid and applicable except for those changes made explicitly herein. Many portions of the HCP were incorporated into the DEIS by reference; those referenced sections pertain to the draft HCP as later modified by changes which would be reflected in the final HCP. Because the Preferred Alternative (i.e., proposed HCP) is an integral part of this document, all changes to the HCP, including changes to the Implementation Agreement, have been displayed in Appendices 4 and 5. Those action items with particular relevance to operations have been summarized in Appendix 3 for the convenience of the reader. As mentioned earlier, Technical Reports referenced in the HCP and the DEIS are not a part of those documents and are not a necessary part of the application package. They were made available during the comment period for convenience of the readers only.

The Services are currently fulfilling their obligations under section 7 of the ESA. Upon completion of the comment period, and the associated review of the comments and revision of the Proposed Plan, the Services initiated consultation/conferencing under section 7. This is to fulfill the needs of a section 7 intra-Service consultation and to determine whether the section 10 issuance criteria are being met with regard to avoidance of jeopardy. The Services will prepare the section 7 documents, a Set of Findings, and a Record of Decision prior to approving the Incidental Take Permit. A Notice of Issuance would be issued shortly after any approval and issuance of a Permit.

Description of FEIS Format

This FEIS contains much of the normal introductory material which preceded this section (e.g., title page, cover sheet, abstract, and table of contents). Following this section is the body of the FEIS. The outline is identical to that of the DEIS. For each section which does not differ from the DEIS to the FEIS, the term "No Change" is used to designate that section. Where a change is being incorporated from what was presented in the DEIS, that change is presented and discussed. First, the nature of the change is often discussed (e.g., a paragraph is being appended, a sentence is being revised, a word is deleted, a table is corrected). Next, the reason for the change is often discussed briefly. Last, the change itself is presented in redline/strikeout format. Shaded (redline) words and characters are additions, and the words and characters which are lined through (~~strikeout~~) are deletions. Following that section is an index to this FEIS document.

There are a number of appendices to this document. Appendix 1 contains the DEIS distribution report which presents the names and organizations of those that received the DEIS, HCP, or summaries thereof for review and comment purposes. This appendix also includes the distribution list for the final EIS. Appendix 2 presents a list of commentors and the summary and response to public comment. Appendix 3 summarizes the changes in HCP action items, and Appendix 4 displays all the changes made to the HCP document. Appendix 5 displays changes to the Implementation Agreement.

SECTION 2.0

CHANGES TO THE DEIS

CHANGES TO THE DEIS

This section of the final EIS has been prepared to amend the draft EIS in response to public comments and review by the Services, and to incorporate additional information, corrections, modifications, and changes. None of the corrections, modifications, and/or changes made to the draft EIS, however, are considered significant by the Services. All portions of the draft EIS should be considered valid and applicable except for those changes or modifications made explicitly herein.

The changes and modifications shown below were made to: (1) clarify the Applicant's Proposed Plan and alternatives outlined in the draft EIS; (2) reduce confusion over the features of the Applicant's Habitat Conservation Plan for multiple species in the I-90 corridor; or (3) to upgrade or modify the components of the Applicant's habitat protection, monitoring, and/or mitigation plans based on public comments.

SUMMARY

INTRODUCTION *(NO CHANGE)*

BACKGROUND RELATED TO THE HCP
DEIS; pg. S-3:
Figure 1 has been corrected to properly display roadless areas and enhanced to show unroaded areas. Data obtained from the Wenatchee National Forest. See the end of this section for revised Figure 1.

PERMIT ISSUES *(NO CHANGE)*
HCP ISSUES *(NO CHANGE)*

ALTERNATIVES, INCLUDING THE PROPOSED PLAN
DEIS; pg. S-6 and S-7: *clarification of the replaced text*
~~Plum Creek considered a number of alternatives during preparation of the HCP. Plum Creek does not consider an alternative viable if it precludes economically beneficial use of their lands. Nor would the ESA section 10(a)(1)(b) require implementation of such an alternative for the issuance of the Permit. Uneconomic alternatives were dismissed in favor of economically beneficial alternatives or continuing operations under existing conditions.~~

The Services have considered a number of alternatives during preparation of the HCP. After identifying various factors that obviated the ability of the Applicant to implement some of the individual proposals, the range of alternatives to be analyzed in further detail was narrowed.

The range of reasonable alternatives is different for each section 10 applicant. To an important degree, the range is constrained by the duty of an applicant to minimize and mitigate effects of predicted take, to the maximum extent *practicable*, as stated in section 10 permit issuance criteria and the accompanying regulations. What is practicable can be expected to be different from applicant to applicant. As a result, the range of alternatives considered, and the range of alternatives analyzed by the Services in detail, can be expected to be different for each applicant.

For the Applicant, a number of alternatives were considered that reflected unique aspects of the Applicant's ownership, and the issues concerning that ownership. However, while several alternatives were considered, all but four were eliminated from detailed analysis because they were either unlikely to be implemented, inconsistent with otherwise lawful commercial forest management, economically impracticable, or operationally unfeasible. In keeping with the Services' responsibilities under NEPA, a brief explanation for the elimination of those alternatives not analyzed in detail is provided in the Alternatives section of the EIS.

No-Action - Current Regulations *(NO CHANGE)*
DEIS; pg. S-9:
Table 1
Watershed Analysis
add the following, under No-Action Alternative:
No Watershed Analysis initiated by the Applicant

Riparian Alternative *(NO CHANGE)*
Dispersal Alternative *(NO CHANGE)*

Proposed Plan

DEIS; pg. S-14:
Northern Spotted Owl

" Identify and classify NRF, FD (HCP Section 2.4), and non-habitat in the 418,689 acres within the Planning Area throughout the Permit period.

DEIS; pg. S-15:
Northern Spotted Owl

" Conduct ~~demographic~~ model and deferral validation surveys to verify the RSPF model and evaluate the effectiveness of Plum Creek's harvest deferrals and dispersal corridors in maintaining the viability of selected spotted owl nest sites.

DEIS; pg. S-16:
Marbled Murrelet - Nest Site Protection

" Suitable habitat would be protected in all directions from an occupied stand until a 100 meter break in suitable habitat is encountered; ~~and~~ or

" An upper limit of 500 acres would be established per nest site. Plum Creek and FWS would cooperatively determine "the best 500 acres," regardless of ownership. The Applicant would protect their portion of the identified "best 500 acres."

DEIS; pg. S-16:
Grizzly Bear ~~Although grizzly bears may not currently occur in the Planning Area, they may emigrate and reside in the Planning Area~~.
State and Federal agencies agree that grizzly bears could occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

DEIS; pg. S-17:

Gray Wolf ~~Although the status of gray wolves in the Planning Area is unknown, wolves may eventually emigrate and reside in the Planning Area~~.

As with the grizzly bear, State and Federal agencies believe that gray wolves could occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

DEIS; pg. S-19:

Special Habitat Management

- o Wetlands
- o Talus Slopes
- o Caves
- o Snag and Snag Recruitment Trees
- o Seeps and Springs
- o Ponderosa Pine Stands

Proposed Mitigation Measures	*(NO CHANGE)*
Plan Implementation	*(NO CHANGE)*

ENVIRONMENTAL CONSEQUENCES *(Changes as shown below)*

DEIS; pg. S-21

Table 2

Protected Wetlands

Change acreage to 1,320 *for all alternatives based on a reevaluation of wetland acreage.*

Comparison of Alternatives	*(NO CHANGE)*
Effects on Land Use Plans	*(NO CHANGE)*
Effects on Soils	*(NO CHANGE)*
Effects on Air Quality	*(NO CHANGE)*
Habitat	*(NO CHANGE)*

Effects on Section 10 (a) Permit Species

DEIS; pg. S-29:

Grizzly Bear ~~Grizzly bears are not currently resident in the Planning Area, although observations in the north and central Mountains indicate that they may be slowly extending their range.~~

State and Federal agencies agree that grizzly bear could occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

DEIS; pg. S-30:

Gray Wolf ~~Gray wolves are currently not known to reside in the Planning Area,although scattered observations indicate their occasional presence~~.

As with the grizzly bear, State and Federal agencies believe that gray wolves could occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

Effects on Aquatic Resources *(NO CHANGE)*
Effects on Fish *(NO CHANGE)*

Effects on Cultural Resources
DEIS; pg. S-31:
Other sites may be present, ~~most likely temporary fishing camps~~ including a variety of resources at stream side locations.

DEIS; pg. S-32:
With these measures, it is less likely that the action alternatives would disrupt an archaeological site in these protected areas. To the extent any presently unknown sites exist in those areas that would receive protection under the various proposed riparian protection schemes, those sites should benefit by being exposed to little or no effect.

DEIS; pg. S-32:
YRMC is developing a predictive model for the region which would help find and/or avoid archaeological important sites. The Applicant proposes to utilize this tool to embellish its efforts at mitigating any possible effects to these resources.

Effects on Local Economies *(NO CHANGE)*
Effects on Recreation Resources *(NO CHANGE)*
Effects on Visual Resources *(NO CHANGE)*

Cumulative Effects
DEIS; pg. S-35:
The Proposed Plan has beneficial effects for the grizzly bear and gray wolf, neutral effects for the marbled murrelet, and slightly adverse effects for the spotted owl. The Proposed Plan has beneficial effects to fish by incorporation of RHAs and by using watershed analysis which is expected to identify and avoid practices which normally lead to fish habitat degradation.

1.0 PURPOSE AND NEED

1.1 PURPOSE AND NEED *(NO CHANGE)*
1.1.1 Need for Action *(NO CHANGE)*
1.1.2 Purpose *(NO CHANGE)*
1.1.3 Applicant's Need for the Proposed Action *(NO CHANGE)*
1.1.4 Services's Planning Objectives *(NO CHANGE)*
1.1.5 Background *(NO CHANGE)*

1.2 RELATIONSHIP TO OTHER PLANS
1.2.1 Relationship to Conservation Plans for Section 10(a) Species

1.2.1.3 Grizzly Bear
DEIS; pg. 1-6:
~~Although grizzly bear sightings have not been confirmed in the Planning Area, bears may occasionally or eventually emigrate from the northern portions of the Northern Cascades Recovery Zone and, perhaps, reside in Plum Creek's ownership~~.

State and Federal agencies agree that grizzly bears could occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

1.2.2 Federal Plans and Regulations *(NO CHANGE)*
1.2.3 State Plans and Regulations *(NO CHANGE)*

DEIS, pg. 1-11:
1.2.4 ~~Other Regional Plans~~ ***Relationship to State and Federal Regulations and Trust Responsibilities*** *(new section)*

The applicability of the Proposed Action pertains to the Endangered Species Act; no other Federal laws or regulations are affected or exempted. No State regulations are superseded by the Proposed Action unless specifically indicated under State law. Nothing in this Proposed Action is intended to limit the Services' responsibilities under treaties with Native American Tribes. Consistent with the guidance from the Secretary of the Interior and the President on these matters, the Services are consulting with the affected Tribes regarding this issue. Possible alterations to the Proposed Action or the implementing documents will be considered following completion of such consultation.

1.2.~~4~~ 5 Other Regional Plans (given new subsection number)
1.3 PERMIT ISSUANCE CRITERIA *(NO CHANGE)*
1.4 ISSUES AND CONCERNS *(NO CHANGE)*
1.5 SCOPING PROCESS *(NO CHANGE)*
1.5.1 Notices and Meetings *(NO CHANGE)*
1.5.2 Public and Agency Comments *(NO CHANGE)*
1.5.3 NEPA Process and Proposed Schedule *(NO CHANGE)*

2.0 ALTERNATIVES INCLUDING THE PROPOSED PLAN

2.1 ALTERNATIVES ANALYZED
2.1.1 No-Action Alternative *(NO CHANGE)*
2.1.2 Proposed Plan *(NO CHANGE)*
2.1.3 Riparian Alternative *(NO CHANGE)*
2.1.4 Dispersal Alternative *(NO CHANGE)*

2.1.5 Alternatives Considered and Dismissed
DEIS; pg. 2-6: *replace these sentences with the following paragraph*
~~A number of alternatives were considered but dismissed as not practicable or not implementable within the foreseeable future. The dismissed alternatives included:~~

In addition to the No-Action Alternative and the three Action Alternatives presented above, a number of other alternatives embodying a variety of prescriptive activities were considered by the Services. Generally, these alternatives contained combinations of prescriptive activities in excess of the proposed HCP Alternative, that were operationally unfeasible, or involved activities that were too speculative to allow the Applicant to determine at this time whether it could practicably implement them. As a result these alternatives are described briefly below, but have not been subject to further analysis in this document.

2.1.5.1 No Harvest on Plum Creek Land

DEIS; pg. 2-6: *replace the existing paragraph with the following*

~~Under this alternative, Plum Creek would no longer harvest mature forests and would not derive economic benefits of their lands. While this alternative has been proposed by several groups, no mechanism has been identified to compensate Plum Creek for foregoing harvest on their lands. Plum Creek estimates that their economic loss would be in the hundreds of millions of dollars.~~

Under this Alternative, the Applicant would discontinue the harvest of mature timber and forego the economic opportunity of being a timberland owner. This and similar alternatives have been proposed by many organizations and individuals in the past, prior to scoping for this Proposed Action, and during the public comment period preceding the preparation of this FEIS.

While forgoing timber harvest activities may be a logical prescription for a portion of any ownership (depending on the time, manner and place of the forgone harvest), discontinuing operations in their entirety is well beyond the scope of prescriptive activities envisioned in section 10(a)(1)(B) of the ESA or for consideration as a viable alternative under NEPA. Any such proposal is patently impracticable to the Applicant and therefore this alternative, while considered, was eliminated from detailed analysis in this document.

2.1.5.2 Federal Aquatic Conservation Strategies

DEIS; pg. 2-7:

Add after the first paragraph:

Because of the checkerboard pattern of ownership in the Planning Area, many streams cross both Federal and nonfederal ownerships. Accordingly, implementing the Federal Aquatic Conservation Strategies outlined above was proposed during the scoping of the Proposed Action. While not as extreme a set of prescriptions as are described in Alternative 2.1.5.1, this alternative is economically impracticable, exceeding the scope of section 10 issuance criteria. As a result, this alternative was not analyzed in further detail in this document.

2.1.5.2 Federal Aquatic Conservation Strategies

DEIS; pg. 2-7:

Some reviewers have suggested that Plum Creek should implement the Federal standards for Riparian Reserves. ~~Plum Creek's analysis indicates that the vast majority of the benefits for water quality, riparian habitat, and dispersal habitat can be achieved within more limited and flexible RHAs~~. However, since the Forest Plan's standards for Riparian Reserves set aside a substantial area of commercial forest, this alternative was dismissed as not being economically practicable.

2.1.5.3 Land Exchanges
DEIS; pg. 2-7:
~~All alternatives allow for the possibility of land sales or exchanges.~~

Add in the place of the last sentence:
While all alternatives allow for the use of land exchanges to contribute to the conservation values in each alternative, the details of any such exchanges are presently too remote to allow an appropriate analysis and comparison of effects under NEPA. The prospects for such exchanges are too speculative at this time. As a result, an alternative premised on land exchanges was not analyzed in further detail in this document, but would likely be the subject of future NEPA analysis.

2.1.5.4 Retention Of Unroaded Areas In Plum Creek Ownership
DEIS; pg. 2-7:
~~Current law provides for Plum Creek's access to their isolated lands, thus retention of any unroaded areas was dismissed from further consideration~~.

Add in the place of the present last sentence:
This alternative was not analyzed in further detail for the same reasons as Alternatives 2.1.5.1 and 2.1.5.2.

2.1.5.5 Include All Plum Creek Properties Within Planning Area
DEIS; pg. 2-8:
~~These lands would be managed under the No-Action Alternative (current regulations) if the Proposed Plan is approved~~.

Replace last sentence with the following:
While this proposal was widely raised in preapplication scoping and during the public comment period, the Services are mindful that the section 10 process is a voluntary, applicant-driven one. Deciding which lands would be covered under an ITP and subject to an HCP is a prominent example of an applicant-driven decision. There exists no legal basis to force the Applicant to cover all or any of its land. In the end, the excluded portion of the property would be managed under the current regulatory regime as opposed to any of the Action Alternatives. This regime consists of the same legal permissions and prohibitions that define the No-Action Alternative. Ironically, these permissions and prohibitions, generally speaking, are the same as those preferred by many public commentors for the entire Planning Area. Because this Applicant determined that it did not want to include certain of its lands in the Planning Area, and these lands were not necessary biologically or for adequate mitigation, this alternative was not analyzed in further detail.

2.2 ASSUMPTIONS AND METHODOLOGIES

2.2.1 Assumed Forest-Management by Forest Service and Others (NO CHANGE)
2.2.2 Ecological Habitat Classification (NO CHANGE)

2.2.3 Forest Inventory Methods

2.2.3.4 Description of Stand-Level Structural Classes

The following changes were made to reflect corrections in size categories for each structural

stage as described in the HCP:

DEIS; pg. 2-17:
Young Forest Stage. This stage is characterized by trees ~~2~~ 3 to 5 inches in diameter.

DEIS; pg. 2-17:
Dispersal Forest Stage. ...West of the Cascades Crest, these stands are characterized by trees between 10 to ~~14~~ 13 inches in diameter with a minimum relative density index of 30 and a minimum canopy closure of 70 percent (RD of ~~30~~ 48 and QMDs of 10 to ~~14~~ 13 inches translate into basal area per acre of 95 to 112). Dispersal forest, east of the Cascades Crest, is characterized by stands 9 to ~~13~~ 12 inches in diameter with a relative density index of ~~35~~ 33 and minimum canopy closure of 58 percent (RD of 35 and QMDs of 9 to ~~13~~ 12 inches translate into basal area per acre of 105 to 126).

DEIS; pg. 2-18:
Managed Old-Growth. This stage is characterized on the west side of the Cascades by average stand diameters ~~of~~ greater than 21 ~~to 28~~ inches and on the east side with average stand diameters ~~of~~ greater than 16 ~~to 21~~ inches. Although these stands can occur naturally as dense, large diameter trees, most of these stands have been treated with a conservative selective harvest, . . .

2.2.4 Multi-Species Approach	*(NO CHANGE)*
2.2.5 Forest Health	*(NO CHANGE)*
2.3 FOREST-MANAGEMENT PRACTICES	*(NO CHANGE)*
2.3.1 Harvest Methods	*(NO CHANGE)*
2.3.2 Harvest Options	*(NO CHANGE)*

2.3.3 Riparian Management Strategy
DEIS; pg. 2-28:
A Riparian Management Strategy is an integral ~~element~~ part of each Action Alternative (see Toth et al. 1995).

DEIS; pg. 2-29: *The word "Feedback" is deleted because feedback is part of the adaptive management component, which includes both riparian and terrestrial components.*

1. Riparian Habitat Protection
2. Watershed Analysis
3. Monitoring ~~and Feedback~~

The following changes were made to the fish-bearing streams section to clarify habitat conditions that would be maintained in the 200-foot RHAs:

DEIS ; pg. 2-32:
2.3.3.1 Riparian Habitat Protection
1) Fish-bearing streams (DNR Types 1-3)
last paragraph, last sentence:
One-time (i.e., one harvest during the Permit period) selective or partial harvests would be allowed in RHAs, if the Applicant can ensure that post-harvest conditions in the RHAs would provide, at a minimum, the equivalent of spotted owl habitat (i.e., FD habitat or greater). These

harvests ~~will~~ would incorporate removal of no more than 50 percent of the merchantable (i.e., commercial) timber volume available for harvest in the 200-foot RHA. Intermittent streams found to be fish-bearing would receive special consideration under watershed analysis.

add as last paragraph:
Type 4 and Type 5 streams with a high likelihood of fish presence or near the confluence of a Type 3 stream would be tested prior to harvest to verify presence or absence of fish to ensure the proper buffers are utilized. Additionally, if a fish-bearing stream has a blockage and the source of the blockage is removed, the stream up to the nearest natural blockage would be treated as a fish-bearing stream.

DEIS, pg. 2-32, 2-33:
2.3.3.1 Riparian Habitat Protection
Two sentences were added to reflect changes to the HCP requested by the Services.

2) Nonfish-bearing, perennial streams (DNR Type 4)
Along perennial streams within Federal Late-Successional Reserves, Adaptive Management Areas, and where elevation and topography are suitable for owl dispersal, Plum Creek would provide 100-foot RHAs on each side of these streams. In addition, watersheds east of the Cascade crest with bull trout, anadromous fish, or 303(d) concerns would receive 100-foot RHAs along perennial streams above 5,000-foot elevation and outside of Late-Successional Reserves and Adaptive Management Areas. Also, ground-based equipment is prohibited in the 30-foot zone nearest the stream for all RHAs.
last paragraph:
In perennial, nonfish-bearing streams that may be susceptible to landslides or debris flows (e.g., inner gorge topography), appropriate sized riparian buffers would be determined through watershed analysis. ~~Intermittent streams found to be fish-bearing will receive special consideration under watershed analysis.~~ In the interim, State regulations preclude harvest and road construction on slopes at risk of failure.

DEIS; pg. 2-37:
2.3.3.3 Monitoring ~~and Feedback~~

2.3.4 Road Management	*(NO CHANGE)*
2.3.5 Reforestation	*(NO CHANGE)*
2.4 SPECIES MANAGEMENT	*(NO CHANGE)*
2.4.1 Northern Spotted Owl Management	*(NO CHANGE)*

2.4.2 Marbled Murrelet Management
DEIS: pg. 2-48 and 2-49:
Criteria were revised to reflect WDFW guidelines to define suitable murrelet habitat.
1. Harvest Deferrals.
~~o residual trees in stands exceed 32 inches DBH; and~~

o stands contain 8 trees per acre greater than 32 inches DBH and these large trees are clumped or contiguous across a patch rather than scattered, isolated remnants above a second-growth canopy.

The above criteria regarding the number of large trees per acre used to determine potential murrelet habitat in lieu of the number of suitable murrelet nesting platforms because of differences in platform measuring methodology between the Applicant and Washington Department of Fish and Wildlife (Hamer 1995) surveys. Two stands were considered unsuitable murrelet habitat without being field surveyed based on prior knowledge of a professional wildlife biologist experienced in murrelet biology. These stands were considered unsuitable because they either were mistyped and contained small, densely-packed trees or were bisected by railroad and power lines and the remaining large trees were scattered, isolated remnants above the existing canopy.

~~o a minimum of two platforms per acre (i.e., large limbs, defects, and mistletoe that could provide nest sites.~~

2. Murrelet Surveys

Plum Creek conducted murrelet surveys on 853 acres in the Planning Area between 1994 and 1995. Of the 853 acres surveyed, approximately 224 acres were on the Applicant's land and 629 acres were on Forest Service ownership.

3. Stand Protection

o Suitable habitat would be protected in all directions from an occupied stand until a 100-meter break in suitable habitat is encountered; ~~and~~ or

o An upper limit of 500 acres would be established per nest site. Plum Creek and FWS would cooperatively determine "the best 500 acres," regardless of ownership. The Applicant would protect their portion of the identified "best 500 acres."

4. Seasonal Protection. Plum Creek would, however, protect these "future" murrelet sites in the Planning Area by deferring harvest ~~in the stands~~ within a 0.25-mile radius ~~during the nesting season~~ from March 1 to August 31.

2.4.3 Grizzly Bear Management
DEIS; pg. 2-51:
~~Although grizzly bears may not currently occur in the Planning Area, they may eventually immigrate to and reside in the Planning Area~~.

State and Federal agencies agree that grizzly bears occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

2.4.4 Gray Wolf Management
DEIS; pg.2-55:
~~Although the status of gray wolves in the Planning Area is unknown, there is a high probability that wolves would eventually emigrate to and reside permanently in the Planning Area during the 50-year Permit Period~~.

As with the grizzly bear, State and Federal agencies believe that gray wolves occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

2.5 SPECIAL HABITAT MANAGEMENT

A number of revisions were made to reflect changes to the HCP requested by the Services.

DEIS; pg. 2-57 to 2-59:

2.5.1 Wetlands

The riparian wetlands would be identified during watershed analysis and appropriate prescriptions to protect the functions and values of these wetlands would be developed. Most of the wetlands within the Planning Area are spatially and functionally associated with rivers and streams. Other wetlands may occur more or less in isolation. These isolated wetlands are generally small, but may have unique characteristics and provide habitat for numerous wildlife species. Plum Creek would implement, as minimum and interim guidelines, ~~the Riparian Management Strategy and~~ standard State Forest Practices Rules and Regulations and the Riparian Management Strategy to protect all wetlands.

Forest Practices Rules and Regulations and watershed analysis may provide adequate protection of wetland features such as water quality, temperature, and habitat for some associated wildlife species (e.g., amphibians), however, they may not be adequate to protect all wetland-dependent species. Species such as cavity-nesting ducks would benefit from larger buffers as would be provided by the Proposed Action for nonforested wetlands and bogs greater than 5 acres in size (see below).

2.5.1.1 Buffer Size and Shape

The Forest Practices Rules and Regulations require buffers, termed wetland management zones (WMZs), on all Type A wetlands and on most Type B wetlands. These regulations would be followed for wetlands less than 5 acres in size. ~~For Type A wetlands greater than 5 acres in size, Plum Creek will retain an average WMZ width of 100 feet.~~ For Type A wetlands between 0.5 and 5 acres, Plum Creek would retain a 50 foot average WMZ, ~~For Type B wetlands greater than 5 acres, Plum Creek will retain an average WMZ of 50 feet~~, and for Type B wetlands between 0.5 and 5 acres the WMZ retained would be a minimum of 25 feet.

Nonforested wetlands and bogs greater than 5 acres would receive a 100-foot minimum and 200-foot average buffer width because of the greater seasonal persistence of open water, seasonal and spatial variation, and year-to-year variation.

2.5.1.2 Additional Wetland Treatments

Although forested wetlands have fewer restrictions on timber harvest than nonforested wetlands, they have special rules designed to protect wetland soils. Cable systems are allowed in forested wetlands, but tractors, wheeled skidders, and other ground-based logging systems may be used only when soil moisture is low or the ground is frozen. At all times equipment use must minimize compaction or disturbance of the soils. Where possible, forested wetlands would be left in a forested condition (i.e., retain a canopy closure of 30 percent).

Plum Creek would allow only one entry every 50 years into each wetland buffer. Where wetlands are located outside of, but associated with, riparian areas, such as off-channel habitats or where

they are located in association with unstable slopes; the minimum buffer width may be waived, after consultation with the Services, in favor of a redirected effort to more appropriately distribute the buffer trees to link these critical habitats. All wetlands which are an integral part of the stream system would receive the appropriate RHA, RLTA, or other treatment as directed by the Riparian Management Strategy. The Services have recommended that harvest unit leave trees should be clumped in proximity to all small wetlands when such options exist and do not conflict with higher-priority ecological objectives.

Residual Trees. The size and number of leave trees for wetland buffers are specified in the State Forest Practices Rules and Regulations. In addition to these specifications, the leave trees would be representative of pre-harvest tree sizes and species.

Road Building and Equipment Exclusion. In planning roads and landings, Plum Creek ~~will~~ would comply with State regulations and attempt to avoid wetlands. If wetlands cannot be avoided, Plum Creek would maintain natural drainage and reduce impacts by minimizing subgrade width and spoil areas. If Plum Creek is unable to minimize impacts, the Company would restore affected areas, reduce impacts, or replace affected wetlands as specified by State Forest Practices Rules and Regulations. Also, if a particular road segment necessitates filling or draining more than 0.5 acres of wetland, the Company would compensate for that fill (or drainage) by creating new wetlands or by enhancing existing wetlands.

The area adjacent to the edge of a wetland would be maintained free from ground-based equipment. This would avoid direct impact to amphibians and other wetland edge-dependent species and prevent compaction of soil and interstitial spaces in the substrate. In addition, ground-based equipment would not be allowed in the following areas:

1) Within a nonforested wetland;
2) Within 25 feet of a nonforested wetland edge, where the wetland exceeds 0.5 acres; and
3) Within 25 feet of an open water area associated with a forested wetland, where the wetland exceeds 0.5 acres.

2.5.2 Talus Slopes

DEIS; pg. 2-59:

Although these areas represent a relatively small portion of the landbase in the Planning Area, they are important special habitat which ~~maybe~~ may be adversely affected by road construction and timber activities.

Residual large green trees and snags would be left within 100 feet of the sites. Where possible the objectives of maintaining shade and providing a source of course woody debris would be met.

2.5.3 Caves

DEIS; pg. 2-59:

The Services' definition of a cave includes, naturally occurring cavities or recesses large enough to contain a human (interpreted as a 2 foot by 2 foot opening with at least 4 feet of depth), with attributes of high humidity, stable temperature (interpreted such that the opening:passage relationships are either cylindrical or the opening is restricted, or depth of the cave is significantly deep so that air does not flow freely to and from the outside causing desiccation and rapid temperature changes in the cave), and has a zone characterized by darkness and silence (water

dripping or running is an exception). Caves with known maternal colonies or hibernacula for significant numbers of bats would meet minimum size and shape requirements. If cave passages are sufficiently deep, road building may be permissible directly above the passages. If passages are shallow, recommendations for road building and equipment may be warranted in areas above and immediately adjacent to those passages.

There are currently no known caves in the Planning Area. If a cave is discovered in the Planning Area, the Applicant would notify the Services. It would be the responsibility of the Services, in conjunction with the State Department of Fish and Wildlife, to map the cave and recommend prescriptions to avoid compromising the integrity of the cave passages. The Applicant would reduce the potential for impacts by establishing a buffer around the entrance to caves. This buffer would be designed around site-specific conditions, but would not be less than 100 feet from the entrance of the cave. The 100-foot buffer would be managed, if adequate trees and size classes are available, to approximate FD habitat similar to that prescribed for the 100-foot riparian buffers.

Many species of wildlife including Townsend's big-eared bats roost almost exclusively in cavities and caves, both man-made and natural. Potential impacts to bats and other species may include disturbance of caves used for hibernation, denning, or other activities. Additional steps to protect known hibernation or denning caves includes prohibition of human disturbance near the entrance of caves, and elimination of the spraying of herbicides or fertilizers within 100 feet of caves. A managed buffer of this size was developed in conjunction with the Services and is considered adequate to maintain stable temperature and relative humidity in adjacent caves and to address the biological needs for most, if not all, cave-dependent species. It is important to note that it is not the intention of the Applicant to buffer every depression, hole, or fissure found in rock outcrops. Rather, the Applicant would protect all caves discovered which are sufficiently deep and narrow of opening that provide a stable environment for cave-dependent species.

2.5.4 Snags and Recruitment Trees

DEIS; pg. 2-60:

Hollow snags have been identified by the Services as important habitat for swifts, fisher, and marten. Although hollow snags are relatively rare in comparison with similarly sized solid snags, they would be given high priority for retention at all sites. However, if these or any other standing snags present a safety hazard, they would be felled and either left in place or removed.

2.5.5 Seeps and Springs *(new section added to reflect changes to HCP requested by the Services)*

DEIS; pg. 2-60:

Seeps and springs represent areas transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered periodically, by shallow water. Although these special habitats may be small and difficult to locate, they may have unique characteristics and provide habitat for specialized plants and animals not provided elsewhere in riparian areas. Foremost among the wildlife species that depend upon these special habitats (e.g., mineral springs) is the band-tailed pigeon (*Columbia fasciata*). During the breeding season (i.e., April through September) the main population of these birds occurs below 1,000 feet elevation in western Washington forests exhibiting good interspersion of seral stages and openings, abundant food resources, and mineral springs (Sanderson 1977). Band-tails are known to seek sources of mineral salts necessary for the production of "crop milk" for feeding young birds (Sanderson 1977). The most common sources of these minerals are from mineral springs and brackish water in estuary

tide channels (Sanderson 1977). In late summer, these birds move into higher elevations in response to the increasing availability of fruits and berries. By late September most band-tails depart for southern wintering areas (Jeffrey 1989).

To prevent or reduce impact to these habitats and wildlife species that depend upon them, such as the band-tailed pigeon, the Applicant would implement, as minimum and interim guidelines, the Riparian Management Strategy and standard State Forest Practices and Regulations. The biological objectives are to protect and maintain the integrity of known seeps and mineral springs, while retaining trees adjacent to these habitats to maintain water quality, provide shade, and provide downed logs for forage and shelter. Activities within 200 feet of mineral springs would be coordinated with the Services and designed to retain adequate trees for perching, and to maintain berry, fruit, and mast-producing shrubs and trees which provide food sources, particularly in openings in proximity to the mineral springs (Roderick and Milner 1991). Trees designated for harvest in proximity to seeps and mineral springs would be felled directionally away from these habitats. Skidding and yarding activities would be avoided and all ground-based logging equipment would be prohibited from entering these habitats. Residual large green trees and snags within 25-feet of these sites would be left, and either clumped or scattered depending upon operational feasibility. In addition, under their corporate Environmental Principles, the Applicant voluntarily minimizes its use of herbicides, and the company exceeds State Forest Practices Rules and Regulations by prohibiting spraying in riparian areas, and by not allowing spraying within 100-feet of water bodies.

2.5.6 Ponderosa Pine Stands

DEIS; pg. 2-60:

The Applicant utilizes selective harvesting in Ponderosa pine stands where such techniques are operationally and silviculturally appropriate. Continued use of selective harvesting would result in multi-aged stands over the Permit period. Table 30b (HCP Section 3.5.3 in FEIS Appendix 4) presents an analysis of stand structural stages within the Ponderosa pine/Lodgepole pine forest class during the Permit period. Where development of a multi-aged forest is not possible, the Applicant would enhance opportunities for biological diversity by leaving trees of various size classes, as well as existing snags and snag recruitment trees.

2.6 PLAN IMPLEMENTATION *(NO CHANGE)*
2.7 MONITORING *(NO CHANGE)*
2.7.1 Habitat Verification *(NO CHANGE)*

2.7.2 Spotted Owl Monitoring

DEIS; pg. 2-62:

Spotted owl monitoring would be conducted to ~~evaluate the effectiveness of harvest deferrals in maintaining the viability of the 30 spotted owl nests identified in the high density "cluster areas," and to~~ verify the assumptions of the RSPF model (Irwin and Hicks 1995) and verify the effectiveness of selected harvest deferrals in maintaining site occupancy. ~~Demographic surveys to reestablish contact and to locate spotted owl nest sites in "cluster areas" would be completed for two years prior to major reporting dates, in years 2, 5, 10, and 20 (Table 4). These cluster sites are located in the AMA and LSR portions of the Planning Area.~~ Model and deferral validation surveys will be conducted to reestablish contact and to locate all spotted owl nest sites in approximately 15 percent

of the Planning Area. Survey areas will be distributed in LSR, AMA, and Matrix landscapes within the Green River, I-90 Lakes, and Taneum subunits of the Planning Area. Survey methodology would be determined with the FWS and incorporate a two-visit survey sequence each season, surveying of likely habitat, and use of appropriately distanced calling stations (i.e., 1/4 to 1/2 mile distance between calling stations). The demographic data would be gathered for two seasons prior to reporting years 2, 10, 15, 20, and 40 (Table 4). Spotted owl sites within the survey areas which were targeted with deferrals will be monitored for occupancy for the duration of the deferral period. Approximately 16 deferrals which support 9 sites are encompassed by currently established survey areas. As additional owls are located, they may be banded, at the discretion of the Applicant, to facilitate identification upon later sightings.

Spotted owl habitat availability would be monitored using the RSPF model. By combining the RSPF model with results of the spotted owl monitoring and GIS information, the "carrying capacity" of owls would be determined through the 50-year Permit period. Monitoring would verify that NRF and FD habitat are present at the projected levels, and that the estimated number of owls remain within predicted ranges.

2.7.3 Marbled Murrelet Monitoring *(NO CHANGE)*
2.7.4 Grizzly Bear Habitat Monitoring *(NO CHANGE)*

2.7.5 Gray Wolf Habitat Monitoring
DEIS; pg. 2-63:
~~Although the status of gray wolves in the Planning Area is unknown, there is a high probability that gray wolves would eventually immigrate and reside permanently in the Planning Area during the Permit Period.~~

As with the grizzly bear, State and Federal agencies believe that gray wolves occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

2.7.6 Aquatic Resources Monitoring
Objective 1: Provide landscape-wide monitoring of habitat conditions over the Permit period.

Method 2
DEIS; pg. 2-64, *add as second paragraph:*
Site-specific monitoring as a result of watershed analysis will be conducted over the Planning Area. For example, McNeil streambed samples will be taken to monitor a fine sediment production study for a road network in the Taneum Creek watershed, and during a hydrological study investigating how forest management activities on the east side of the Cascades can affect streamflow.

DEIS; pg. 2-64*; add as last paragraph under Objective 1, Method 2:*
Monitoring and research is another vital component of watershed analysis and is consistent with an adaptive management strategy. Watershed analyses are revisited every five years to make appropriate changes in prescriptions based on monitoring data or advances in scientific

understanding. Examples of monitoring and research done as a result of watershed analysis include: (1) a road sediment production study; (2) McNeil sampling of streams to assess fine sediment levels; (3) installation of two stream gages; (4) testing of digital elevation hydrologic models; (5) stream temperature monitoring; and (6) stream surveys to evaluate channel changes and large woody debris levels. If data indicates that prescriptions are not effective or inadequate, changes in the prescriptions would be made.

Objective 2: Analyze the effects of the various riparian habitat area (RHA) management strategies on stream temperature

Method 1

DEIS; pg. 2-64; *added to end of last paragraph under Method 1:*

Temperatures will be monitored for ~~2~~ 5-years, during the period July 1 through September 15 (Table 4). Two years of monitoring will occur prior to riparian treatments and three years post-treatment. In the event that summer temperatures are unusually low or data are deemed insufficient to draw conclusions about the effectiveness of the various riparian management strategies, monitoring will be extended beyond the 3-year post-treatment period. During this period, stream temperatures would be recorded hourly. It is important to point out that this temperature monitoring would be in addition to the stream temperature monitoring that would be conducted as a part of watershed analysis.

DEIS; pg. 2-65; *delete Method 2 paragraph (it has been added to Objective 1):*

~~Site-specific monitoring as a result of watershed analysis will be conducted over the Planning Area. For example, McNeil streambed samples will be taken to monitor a fine sediment production study for a road network in the Taneum Creek watershed, and during a hydrological study investigating how forest management activities on the east side of the Cascades can affect streamflow~~.

DEIS; pg. 2-65; *change method numeration to reflect the above change:*

Method ~~3~~ 2

Objective 3: Assess fish populations in the context of recovery of habitat conditions in Cabin Creek.

DEIS; pg. 2-65:

Plum Creek would conduct fish population surveys during the Years 1,2,3,4,6,8,10, and then, every 10-years thereafter (Table 4). Adaptive management (HCP Section 5.4.2) would be particularly important if monitoring detects trends which may require corrective actions.

Objective 4: Assess the biological integrity of streams in the Planning Area over the Permit period.

DEIS; pg. 2-66:

Long-term monitoring of aquatic insect species composition and abundance in the Little Naches River, Cabin Creek, and Snow Creek will provide information on watershed health that physical habitat measurements alone may not reflect. Two to three samples in two riffles will be collected from each stream during September. Sampling once a year with multiple samples per riffle is an effective sampling strategy if conducted in a consistent manner (Jim Karr, pers. comm., Univ. of Washington). ~~Aquatic insects will be collected from the stream substrate using a modified Surber square-foot sampler. Insects in each sample will be sorted, counted, and identified. Three stations~~

~~in the Little Naches River will be monitored during May, July, and September.~~ Samples will be collected in Years 1, 2, 3, 4, 6, 8, 10, and then every 10 years thereafter, during the HCP Phase. The adaptive management approach (HCP Section 5.4.2) would provide a feedback mechanism to evaluate monitoring data and a basis for determining if corrective actions are necessary.

2.7.7 Lifeform Habitat Monitoring *(NO CHANGE)*

2.7.8 Breeding Bird Surveys *(NO CHANGE)*

2.8 REPORTING

DEIS; pg. 2-69:

Table 4 has been changed to clarify spotted owl monitoring as opposed to spotted owl demographics, and modified to indicate the movement of owl monitoring from years 4 and 5 to years 39 and 40 to provide data in support of the Safe Harbor provisions outlined in the Implementation Agreement. A revised Table 4 (HCP Table 31) has been included in this FEIS at the end of Appendix 4.

2.9 ADAPTIVE MANAGEMENT *(NO CHANGE)*

3.0 AFFECTED ENVIRONMENT *(NO CHANGE)*

3.1 ENVIRONMENTAL SETTING

3.1.1 Plum Creek's Cascade Timberlands

DEIS; pg. 3-2:

Table 5 has been modified to more accurately reflect the acres by ownership in the Designated Areas and Matrix as outlined in the Northwest Forest Plan. See the end of this section for revised Table 5.

3.2 LAND USE AND LAND OWNERSHIP *(NO CHANGE)*

3.2.1 Allowable Land Uses Within the HCP Planning Area *(NO CHANGE)*

3.2.2 Land Access *(NO CHANGE)*

3.3 LANDFORM AND GEOLOGY *(NO CHANGE)*

3.3.1 Landform *(NO CHANGE)*

3.3.2 Bedrock Geology *(NO CHANGE)*

3.3.3 Soils *(NO CHANGE)*

3.3.4 Mass-Wasting and Surface Erosion *(NO CHANGE)*

3.3.5 Special Soils *(NO CHANGE)*

3.4 AIR QUALITY *(NO CHANGE)*

3.5 WATER QUALITY AND QUANTITY

3.5.1.1 The Green River Subbasin

DEIS; pg. 3-19:

Figure 3 under this heading incorrectly includes the Tacoma Utility dam and the Howard Hanson dam and reservoir in the HCP Planning Area. Figure 3 has been modified to show the correct western boundary of the Planning Area in the Green River Subbasin. A revised Figure 3 has been included in this FEIS at the end of Appendix 4.

3.6 FOREST AND RIPARIAN VEGETATION *(NO CHANGE)*

3.6.1 Forest Inventory, Forest Types, and Stand Structure *(NO CHANGE)*

3.6.2 Riparian Corridors and Wetlands *(NO CHANGE)*
3.6.3 Forest-Health *(NO CHANGE)*
3.6.4 Rare Plant Communities *(NO CHANGE)*

3.6.5 Endangered and Threatened Plant Species *(NO CHANGE)*
3.6.6 Noxious Plants and Weeds *(NO CHANGE)*
3.7 WILDLIFE *(NO CHANGE)*
3.7.1 Wildlife Overview *(NO CHANGE)*
3.7.2 Section 10(a) Species *(NO CHANGE)*

3.7.3 Special Emphasis Species

3.7.3.8 Little Willow Flycatcher
DEIS; pg. 3-71:
~~Sedwick~~ Sedgwick and Knopf 1992

3.7.3.9 Olive-sided Flycatcher
The following section should be added after Section 3.7.3.9 to describe the status and habitat requirements of the band-tailed pigeon. The status of this species in the Cascade Mountains has declined recently, and is therefore, a species of concern which warrants special attention not provided in the DEIS.

3.7.3.9a Band-tailed Pigeon (*Columbia fasciata*)
DEIS; pg. 3-71:
The band-tailed pigeon is a migratory, upland bird in Washington that generally occurs west of the Cascade crest, often in proximity to mineral springs (Rodrick and Milner 1991). Concern for this species has been prompted by the population decline reflected in breeding bird surveys and harvest surveys. Populations of this species in Washington have exhibited the most notable decline (Braun 1994). Although "call-count" surveys in Washington have shown a long-term, nonsignificant decline, they also indicate recent recovery of the populations. Similar results with mineral spring surveys have been observed in Oregon. An experimental mineral spring survey was initiated in Washington in 1993. Results from both mineral spring and "call-count" surveys indicate substantial increases in population numbers between 1993 and 1994 (Dolton 1994). The band-tailed pigeon is a game species. Bag limits and season length were gradually restricted until 1991. In 1991, the hunting season for these birds in Washington was closed. Suspected causes of the long-term decline of band-tailed pigeons include susceptibility to habitat disruption from harvesting, disease (i.e., trichomoniasis), contaminants, and reduced forage as a result of herbicide spraying.

During the nesting season (approximately between March and August) pigeons usually occur below 1,000 feet elevation, but use higher elevation areas in late summer where foods are more abundant (Rodrick and Milner 1991). These birds are found in the coniferous forest zone and are associated with mixed-conifer-hardwood habitats. This species typically uses a stick platform in a conifer tree as a nest (Ehrlich et al. 1988; Braun 1994). During the nesting season, band-tailed pigeons are most common in forests with various seral stages and openings that are well interspersed (Rodrick and Milner 1991). They feed on plants,

primarily buds, flowers, and fruits of oaks (*Quercus* spp.), madrone (*Arbutus texana*), elderberry (*Sambucus* spp.), cherry (*Prunus* spp.), cascara (*Rhamnus* spp.), huckleberry (*Vaccinium* spp.), dogwood (*Cornus* spp.), and blackberry and raspberry *(Rubus* spp). In addition, band-tails feed on cultivated fruits and grain (Braun 1994). This species is dependent upon the availability of mineral sources (e.g., mineral springs) for producing crop milk for juveniles (Braun 1994). Conversion of older, more complex forest to young monocultures, and the use of herbicides, and other vegetation management may be detrimental to the band-tailed pigeon by limiting suitable habitat, plant foods, and the availability of mineral sources (Braun 1994).

3.7.4 Species of Concern *(NO CHANGE)*

3.7.5 Associated Species

DEIS; pg. 3-85:

Table 16. Lifeform Descriptions used in Plum Creek's HCP:

Lifeform 13a, Secondary habitat, YF/PT should be "after 20 years", not ~~10 years~~.

Lifeform 16 Add "beavers" to Lifeform

3.7.5.1 Lifeforms

DEIS; pg. 3-96:

Lifeform 13 and 13a (Woodpeckers and nuthatches)

Secondary habitat for Lifeform 13a includes young forest, pole-timber, and recently harvested areas,

3.8 FISH AND FISH HABITAT *(NO CHANGE)*
3.8.1 Overview *(NO CHANGE)*
3.8.2 Green River Basin *(NO CHANGE)*
3.8.3 Yakima River Basin *(NO CHANGE)*
3.9 SOCIO-ECONOMIC *(NO CHANGE)*
3.10 CULTURAL RESOURCES *(NO CHANGE)*
3.10.1 Prehistoric and Ethnographic Overview *(NO CHANGE)*
3.10.2 Historic Overview *(NO CHANGE)*
3.10.3 American Indian Uses and Concerns *(NO CHANGE)*
3.10.4 Cultural Resources Preservation *(NO CHANGE)*

3.11 RECREATION

DEIS; pg. 3-114:

Within the area, the Mount Baker-Snoqualmie and Wenatchee National Forests provide numerous opportunities for recreation including: hiking, camping, picnicking, horseback riding, fishing, hunting, off-road-vehicle use, mountain biking, mushrooming and berry picking, scenic driving, wildlife viewing, rock hounding, cross-country and downhill skiing, snowshoeing, snowmobiling, and mountain and rock climbing.... Other activities such as off-road vehicle use (e.g., motorcycling) and snow-mobiling take advantage of the roads and trails maintained by the Forest Service.

3.12 VISUAL RESOURCES

DEIS; pg. 3-118:

Change in last paragraph

The current patterns seen from I-90 reflect past timber practices by Plum Creek (and the preceding land managers), the Forest Service, and other owners.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 RESOURCE MANAGEMENT PRACTICES

4.1.1 No-Action Alternative

DEIS; pg. 4-1:

Approximately 18,100 acres of restricted owl habitat in 1.8-mile radius circles...

4.1.2 Proposed Plan *(NO CHANGE)*

4.1.3 Riparian Alternative *(NO CHANGE)*

4.1.4 Dispersal Alternative *(NO CHANGE)*

4.2 ROAD DENSITIES *(NO CHANGE)*

4.2.1 No-Action Alternative *(NO CHANGE)*

4.2.2 Proposed Plan *(NO CHANGE)*

4.2.3 Riparian Alternative *(NO CHANGE)*

4.2.4 Dispersal Alternative *(NO CHANGE)*

4.3 LAND USE AND LAND OWNERSHIP

4.3.1 No-Action Alternative

DEIS; pg. 4-5:

Plum Creek's harvest activities would be restricted within 1.8-mile radius ~~diameter~~ owl circles.

4.3.2 Proposed Plan

DEIS; pg. 4-6:

The Proposed Plan recognizes SPAMA as an important connective link in the north-south movement of organisms in the Cascade Range (ROD; page D16).

DEIS; pg. 4-7:

However, the Standards and Guidelines for the Northwest Forest Plan (ROD; page C-19) recognize access to nonfederal lands over Forest Service lands, including through LSRs, as a valid use.

4.3.3 Riparian Alternative *(NO CHANGE)*

4.3.4 Dispersal Alternative *(NO CHANGE)*

4.4 LANDFORM, GEOLOGY AND SOILS *(NO CHANGE)*

4.4.1 No-Action Alternative *(NO CHANGE)*

4.4.2 Proposed Plan

DEIS; pg. 4-11:

Under the Proposed Plan, RHAs would be maintained along ~~most~~ all fish-bearing streams (Type 1-3) and most nonfish-bearing, ~~intermittent~~ perennial (Type 4) streams which would not receive comparable protection under current regulations. Timber falling contractors would be required to avoid yarding logs through the streams not categorized above. In addition, ~~they~~ contractors must refrain from causing soil erosion or degrading side slopes.

4.4.3 Riparian Alternative *(NO CHANGE)*

4.4.4 Dispersal Alternative *(NO CHANGE)*

4.5 AIR QUALITY *(NO CHANGE)*

4.6 SURFACE WATER *(NO CHANGE)*

4.6.1 No-Action Alternative

DEIS; pg. 4-15:

The No-Action Alternative would likely have the least protection for surface water quality because neither Plum Creek's Environmental Principles nor Watershed Analysis initiated by the Applicant would be conducted. ~~Standard forest practice rules~~ Standard Forest Practices Rules and Regulations would apply to all road construction and maintenance.

The No-Action Alternative would likely have the least protection for surface water quality because neither Plum Creek Environmental Principles nor Watershed Analysis initiated by the Applicant would be conducted.

4.6.2 Proposed Plan *(NO CHANGE)*

4.6.3 Other Alternatives

DEIS; pg. 4-16:

The Riparian and Dispersal Alternatives would include neither Environmental Principles, nor State Watershed Analysis initiated by the Applicant.

4.7 VEGETATION *(NO CHANGE)*

4.7.1 Stand Structure *(NO CHANGE)*

4.7.2 Forest-Health *(NO CHANGE)*

4.7.3 Protected Plant Communities/Special Habitats *(NO CHANGE)*

4.7.3.1 No-Action Alternative

DEIS; pg. 4-22:

Riparian and Wetland Areas

Using the assumptions stated in Table 24, only 2,127 acres of riparian habitat would be in RMZs and receive some level of protection under the No-Action Alternative. ~~The~~ This would be a greater impact on riparian plants listed in Tables 9 and 10 under this alternative than the action alternatives because of the greater harvest in the riparian zone.

DEIS; pg. 4-23:

Table 24. Riparian protection strategy for the No-Action and Action Alternatives.

Proposed Plan, Riparian, and Dispersal Alternatives

Change the Table to reflect the increase in miles of streams with 100-foot buffers on Type 4 streams in LSR and AMA. Stream type under Plum Creek's Proposed Plan; change 152 under 100 ft. RHA to 165, and change 24 under 25 ft RLTA to 11.

4.7.3.2 Proposed Plan

DEIS, pg. 4.24:

Delete the word "not" to affect a correction.

Snags and snag recruitment would ~~not~~ be a priority.

4.7.4 Nonvascular Plants and Invertebrates (All Alternatives) *(new subsection)*

Nonvascular plants and invertebrates may be impacted by the Alternatives. The Preferred Alternative (issuance of the HCP based on the proposed plan) does not provide any exemption to the Applicant with regard to these species. The most likely species to be impacted under this Plan and its alternatives are those dependent on late-successional interior forest. Under Section 4.14.5 Forest and Riparian Vegetation, the Services' discuss the effects and cumulative effects of the alternatives upon patch size and microclimate. It is possible under all alternatives that some impact to these species may occur as a result of smaller patch sizes and changes in microclimate which may cause desiccation or rapid temperature changes. It is expected that the checkerboard pattern of land ownership, potential land exchanges, and the efforts of the Applicant to increase effective patch size would ameliorate the impacts upon these species. Projections of habitat throughout the Permit period indicate only minor differences in stand structure amounts and indicate that all seral stages will be represented.

4.8 WILDLIFE

4.8.1 Section 10(a) Permit Species

4.8.1.1 Northern Spotted Owl

DEIS; pgs. 4-29 to 4-32:

No-Action Alternative. Under this alternative, it is ~~expected~~ assumed for purposes of analysis that all suitable habitat (18,100 acres), within 1.8-mile circles below the recommended 40 percent habitat threshold~~s~~ values on Plum Creek land would be left intact temporarily around spotted owl sites (Table 25). The data presented in Table 25 does not take into account the potential for some owl management circles to be eliminated through documentation of owl absence and the subsequent harvesting of suitable owl habitat within circles to below threshold values. Because the future movement and occupancy of owl sites cannot be predicted exactly, the elimination of certain owl circles and resultant impacts to harvesting of suitable habitat and carrying capacity could not be factored into the analysis of the No-Action Alternative. Moreover, 1.8-mile circles represent a generalized guideline for avoiding take of owls. Each individual site would have to be analyzed separately to determine whether take would occur. Thus, more habitat could be removed under the No-Action Alternative. Currently, the Applicant follows the guidelines of the FWS regarding harvesting within 1.8-mile radius circles around spotted owl nest sites to ensure that take will not occur. However, this is not a regulatory restriction and under this alternative, the Applicant may harvest below the 40 percent threshold if the Services could not show that harm or take would occur.

Amount and Type of Habitat. *(Add to end of paragraph)*

To assess impacts from the potential future elimination of some owl circles, the amount of suitable owl habitat that would be available for harvest was calculated for identified owl sites. Fourteen owl sites were identified as likely to be eliminated from circle status based on their past occupancy (i.e., vacant for at least the last two years) and information from past surveys (e.g., movement of individuals, no daytime visuals for multiple years, no recent detections). This analysis showed that approximately 2,200 acres of suitable habitat from the 14 owl sites in the Planning Area would become available for harvest. In addition, stands in owl circles would be harvested before they reach owl habitat designation. Changes to the amount of owl habitat presented in Table 14 for the No-Action Alternative may be accelerated in the earlier decades based on the location and access to these sites for harvest. This reduction in habitat during the early decades of the Permit period may potentially affect owl populations during this time (see Carrying Capacity below).

Distribution of Habitat.
In the No-Action Alternative, temporarily restricted owl habitat is retained, but all unrestricted owl habitat outside of RMZs would be harvested. This would cause fragmentation of owl habitat and loss of connectivity between owl habitat patches on Plum Creek land and adjacent National Forest lands unless a patch was contiguous with National Forest land. More road construction would likely be needed to access the randomly located harvest units that become available if certain owl circles are eliminated based on surveys documenting absence for three consecutive years.

Carrying Capacity for Owls.
Application of the Resource Selection Probability Function (RSPF) model (Irwin and Hicks 1995) to the managed landscapes estimated by the ~~Proposed Plan~~ No-Action Alternative and the Northwest Forest Plan suggest that the impacts of the ~~Proposed Plan~~ No-Action Alternative on the area's capability to support spotted owls would be minimal. However, the analysis assumed that owl circles were permanent and therefore, could not take into account the additional harvest of owl habitat that would become available if surveys documented absence for three years in a owl circle. This additional harvest would likely affect the carrying capacity estimates presented in Table 26 for the No-Action Alternative by decreasing the capacity further in the earlier decades. A carrying capacity estimate at the end of the Permit period is speculative because the actual number and location of owl circles that may be eliminated in the future is unknown. More or fewer than the 14 owl circles identified in the analysis above may be eliminated due to movement of owls, natural mortality, and other biological reasons. Carrying capacity estimates presented in Table 26 are calculated based on the assumption that habitat within current owl circles would remain restricted during the Permit period. To provide a "high end" and "low end" estimate of the effects of the ~~Plan~~ alternatives on carrying capacity, the RSPF model was applied to the Planning Area in two different ways.

Forest Patch Size.
Harvest-unit size would conform to State Forest Practices Rules and Regulations and a unit may be as large as 240 acres but more often would be less than 120 acres. All habitat within owl sites would be retained until surveys could document no owl detections for three consecutive years. These sites ~~would~~ may or may not be linked to adjacent NRF on Federal lands by adequate dispersal habitat. North-south and east-west movement of owls in the I-90 corridor ~~would~~ may or may not be supported by sufficient FD habitat. Current regulations do not require protection of dispersal habitat for spotted owls.

DEIS; pg. 4-37:
The following section is being added to reflect the additional information available as a result of preliminary spotted owl impact analyses performed by the Services. A further analysis by the Services would be necessary for inclusion in the final Biological Opinion on the revised Plan to make the findings necessary for Permit issuance, and to satisfy ESA section 7 criteria.

add to end of Section on Proposed Plan:
The Services continue to believe that, as a result of the Proposed Plan, take in the order of 50 sites over the 50 year Permit period is a likely occurrence. However, the Services now believe that the number of owl sites taken would not be equally distributed throughout the Permit period, but rather, greater take may be evident earlier in the Permit period. Analysis using the

"40 percent threshold" indicates that approximately 15 owl sites may be at risk of take during the first decade, approximately 10 sites per decade during the second and third decades, and fewer than 5 sites per decade thereafter. These estimated take amounts do not differ substantially by alternative. For instance, 15 sites are also at risk during the first decade under the No-Action Alternative.

DEIS; pg. 4-35:
Proposed Plan - Amount and Type of Habitat *(add to middle of top paragraph)*
Similarly, FD habitat would decrease slightly in the first 2 decades, from 20 percent in 1996 to 17 percent in 2016, but would increase ~~significantly~~ substantially to 35 percent by 2045 (Table 13).

4.8.2 Special Emphasis Species *(NO CHANGE)*

4.8.3 Species of Concern

4.8.3.2 Birds
DEIS; pg. 4-57:
Golden Eagle
There is ~~no significant~~ very little difference between the alternatives in regard to the amount of suitable habitat over the Permit period (1996=34 percent, 2045=33 percent).

4.8.3.2 Birds
DEIS; pg. 4-59:
Band-tailed Pigeons
During the nesting season, these birds are found in the coniferous forest zone and are associated with mixed-conifer-hardwood habitats. This species is dependent upon the availability of mineral sources (e.g., mineral springs) for producing crop milk for juveniles (Braun 1994).

Proposed Plan. The special habitat requirements of band-tailed pigeons will be addressed through measures taken to address mineral springs and seeps (HCP Section 3.4.5). The limited use of herbicides as indicated in Section 1.2.3 of the HCP would serve to preserve the usefulness of early-successional habitats as forage production areas. The band-tailed pigeon is included in Lifeform 11, for which primary habitat is defined as the percentage of management units occurring in the middle to later stages (i.e., pole timber through old growth), and with secondary habitat as the percentage of units occurring as stand initiation, shrub/sapling, and young forest stages (Table 15).

Primary habitat for species in this Lifeform is expected to increase across the Planning Area throughout the Permit period (Table 26). Therefore, the needs of band-tailed pigeons should be accommodated under the HCP.

Other alternatives. Potential impacts under other alternatives would be greater than the Proposed Plan. Under all other alternatives, no particular attention would be given to mineral springs or the provision of mast-bearing and berry-producing plants in the vicinity of mineral springs or in early-successional habitats. However, provision of mature coniferous habitats for nesting would likely be sufficient under all the alternatives.

4.8.4 Associated Species

DEIS; pg. 4-67:

Lifeform 5 - Proposed Plan, Riparian, and Dispersal Alternatives

None of the alternatives differed ~~significantly~~ substantially from the No-Action Alternative.

DEIS; pg. 4-69:

Lifeform 9

Proposed Plan - Riparian and Dispersal Alternatives

The Environmental Principles and selective harvests in ~~representative removal from~~ RHAs would provide vegetative ~~species~~ structural diversity.

DEIS; pg. 4-72:

Lifeform 13

Proposed Plan

Environmental Principles employed by the Applicant normally require ~~retain~~ retention of larger trees and snags in ~~general~~ harvest units. The trees and snags retained would contribute to the ~~structure~~ structural diversity of the forests and this structural diversity would be maintained throughout the Permit period. ~~which would be present as forests regenerate~~.

DEIS; pg. 4-74:

Lifeform 15

Young Forest stages (i.e., Stand Initiation through Young Forest) are expected to become less prevalent throughout the ~~analysis~~ Permit period, as a result of current stands in early stages developing into canopied stands, as well as the relatively low level of harvest assumed on Forest Service lands. Suitable habitat for those species identified as Lifeform ~~15-Early~~ 15 (young-aged) declines from 28 percent of the Planning Area to 9 to 11 percent over the Permit period for all of the alternatives.

Suitable habitat for those species identified as Lifeform 15~~-Mid~~ (mid-aged) increases from 24 percent to 41 to 44 percent for all of the alternatives.

Suitable habitat for those species identified as Lifeform 15~~-Late~~ (late-aged) remains essentially stable, starting at 36 percent and ending at 33 to 38 percent, depending on the alternative.

Within the Planning Area ~~On the total HCP land base~~, the acreage of the late stages ~~are~~ is expected to decrease during the first 10 years, then gradually rise during the remainder of the Permit Period, for a slight net increase by ~~the end~~ year 2045.

DEIS; pg. 4-79:

second paragraph

Some impact due to corridors is ~~unavailable~~ unavoidable; however, by...

4.9 FISH AND FISH HABITAT

4.9.1 No-Action Alternative

DEIS; pg. 4-77:

Where access to Plum Creek's inholdings require crossing Federal lands, watershed specific information on the cumulative effects of forest practices would be collected, but formal State Watershed Analysis would not be ~~conducted~~ initiated by the Applicant.

4.9.2 Proposed Plan

DEIS; pg. 4-79:

~~In fact, some reaches that are woody debris depauperate may actually benefit from the short-term addition of some woody debris caused by yarding operations~~. The 30-foot, no harvest zone ~~for all~~ in all 200-foot RHAs would also ensure that trees important for bank stability would be retained.

4.9.3 Riparian Alternative

DEIS; pg. 4-81:

Where access to Plum Creek's inholdings require crossing Federal lands, watershed specific information on the cumulative effects of forest practices would be collected, but formal State Watershed Analysis would not be ~~conducted~~ initiated by the Applicant.

4.9.4 Dispersal Alternative

DEIS; pg. 4-81:

Where access to Plum Creek's inholdings require crossing Federal lands, watershed specific information on the cumulative effects of forest practices would be collected, but formal State Watershed Analysis would not be ~~conducted~~ initiated by the Applicant.

4.10 SOCIO-ECONOMIC	*(NO CHANGE)*
4.10.1 No-Action Alternative	*(NO CHANGE)*
4.10.2 Proposed Plan	*(NO CHANGE)*
4.10.3 Riparian Alternative	*(NO CHANGE)*
4.10.4 Dispersal Alternative	*(NO CHANGE)*
4.11 CULTURAL RESOURCES	*(NO CHANGE)*
4.11.1 No-Action Alternative	*(NO CHANGE)*
4.11.2 Proposed Plan	*(NO CHANGE)*
4.11.3 Riparian Alternative	*(NO CHANGE)*
4.11.4 Dispersal Alternative	*(NO CHANGE)*

4.12 RECREATION

Add to end of first paragraph

DEIS; pg. 4-85:

Some hunters prefer road closures while others do not. Preference for road closures may depend to some degree on the condition and experience level of the hunter, quarry being sought, and the choice of weapon. While some areas would experience additional road closures under the Proposed Plan, many areas would continue to be open to vehicular traffic. The Proposed Plan has no provisions to limit foot-access for any recreational activity.

4.12.1 No-Action Alternative	*(NO CHANGE)*
4.12.2 Proposed Plan	*(NO CHANGE)*
4.12.3 Riparian Alternative	*(NO CHANGE)*
4.12.4 Dispersal Alternative	*(NO CHANGE)*
4.13 VISUAL RESOURCES	*(NO CHANGE)*
4.13.1 No-Action Alternative	*(NO CHANGE)*
4.13.2 Proposed Plan	*(NO CHANGE)*
4.13.3 Riparian Alternative	*(NO CHANGE)*
4.13.4 Dispersal Alternative	*(NO CHANGE)*

4.14 CUMULATIVE EFFECTS

DEIS; pg. 4-92:

Analysis in this document and the HCP indicates that impacts of the Proposed Plan, and the other action alternatives, would not be significantly different from the No-Action Alternative in terms of habitat alteration, and in some ways would be beneficial in comparison to the No-Action Alternative. See Tables 8, 12, and 14, and the ~~Discussion~~ discussion in Section ~~4.13.5~~ 4.13.1.

DEIS; pg. 4-97:

Transportation and Communications

The unused Milwaukee Railroad line (also known as the John Wayne trail) has been converted into a non-motorized, multiple-use trail open to bicyclists, hikers, and horseback riders. ~~a series of hiking trails~~.

4.14.1 Land Use and Ownership

DEIS; pg. 4-97:

~~Any alteration or conditions would require amending the HCP and the Permit.~~

4.14.2 Air Quality *(NO CHANGE)*

4.14.3 Geology and Soils *(NO CHANGE)*

4.14.4 Surface Water

DEIS; pg. 4-100:

~~The four~~ Four streams in the Planning Area are on the 303(d) list because of elevated summer temperatures due to past harvest practices.

4.14.5 Forest and Riparian Vegetation

DEIS; pg. 4-105:

In some cases, streams may be conduits for the distribution of weed seeds and propagules. The RHAs in the action alternatives would buffer harvested ~~distributed (harvested)~~ areas ~~form~~ from this source of noxious plant~~s~~ distribution.

4.14.5.1 No-Action Alternative

DEIS; pg. 4-106:

The Northwest Forest Plan would not realize its objective of either reducing fragmentation or maintaining connectivity across the I-90 Corridor.

4.14.5.2 Proposed Plan

DEIS; pg. 4-107:

Harvests on Plum ~~Creeks~~ Creek's land would not ~~significantly~~ substantially reduce the area of old-growth forests in the Planning Area over the Permit period (Table 8).

~~HCP~~ Figures ~~26~~ 36 and 38 in the HCP show spotted owl habitat in the Planning Area for 1996 and ~~HCP Figure 38 for~~ 2045, respectively.

4.14.6 Wildlife

4.14.6.1 Northern Spotted Owl

DEIS; pg. 4-111

No-Action Alternative. *3rd Paragraph*

The Northwest Forest Plan and management of Plum Creek land following recommendations in the proposed 4(d) Special Rule ~~would~~ might provide a high degree of protection for known owl sites. Protection of known owl sites are temporary and persists until three years of surveys can document spotted owl absence within a 1.8-mile circle. The proposed 4(d) Special Rule ~~These measures~~, however, ~~do~~ would not provide for establishing and/or retaining dispersal habitat between sites. Dispersal habitat is currently below desired levels on Federal and non-federal land. Dispersal habitat ~~will~~ would likely develop on Federal and non-federal lands over the Permit period as forests harvested in the past few decades mature. However, forest stands in owl circles below threshold values on the Applicant's lands would be harvested before they reach suitable habitat designation to prevent the stands from becoming potentially restricted from harvest in the future. This may perpetuate dispersal habitat deficiencies among Federal and non-federal lands in the Planning Area.

4.14.6.2 Marbled Murrelet
DEIS; pg. 4-114:
None of the alternatives would cause ~~significant~~ measurable adverse cumulative effects on marbled murrelet populations in the Planning Area or on regional population.

4.14.6.5 Special Emphasis Species, Species of Concern, and Associates Species
DEIS; pg. 4-117:
Management guidelines for special habitats ~~(e.g., snags, talus slopes, etc,)~~ (e.g., caves, talus slopes, snags, seeps and spring, and Ponderosa pine stands) exceed current FPA requirements and would benefit many of these species.

4.14.7 Fisheries
DEIS; pg. 4-118:
4.14.7 ~~Fisheries~~ Fish and Fish Habitat

4.14.7.1 No-Action Alternative
DEIS; pg. 4-123:
The No-Action Alternative would follow FPA requirements on Plum ~~Creek~~ Creek's lands including RMZs, and ~~the more restrictive~~ RCAs and the Federal ACS would be followed on adjacent National Forest lands. ~~as well as the broad Federal ACS.~~Improvements on other non-federal lands would also occur, but not as rapidly nor to the degree found ~~of~~ on Federal land because of the ~~significantly~~ substantially lower standards for State RMZs.

4.14.7.2 Proposed Plan
DEIS; pg. 4-126:
The ~~riparian habitat management strategy~~ Riparian Management Strategy outlined in the Proposed Plan complements the ACS component of the Northwest Forest Plan on intermingled Forest Service lands.

4.14.8 Socio-Economic *(NO CHANGE)*
4.14.9 Cultural Resources *(NO CHANGE)*
4.14.10 Recreation *(NO CHANGE)*

4.14.11 Visual Resources

DEIS; pg. 4-130:

None of the alternatives ~~would use~~ propose to incorporate large harvest units with rectilinear boundaries.

4.14.12 Change and Flexibility

Proposed Plan

DEIS; pg. 4-131: *add reference*

Potential impacts of amendments would be considered by the Services at the time in the manner prescribed by the IA (HCP Section 5.0).

DEIS; pg. 4-132: *second paragraph deleted and new Section added (see Section 4.14.13 below)*

~~The Implementation Agreement includes a "Safe Harbor" provision (HCP Section 5.3.3). This provision would become effective only in the case of termination. It provides Plum Creek with the opportunity to grow or retain wildlife habitat in excess of its commitments under the Plan with the understanding that excesses in habitat would be available to harvest. This removes disincentives to Plum Creek while providing temporary benefits in terms of wildlife habitat. The impacts of such a provision will extend beyond the Permit Period. However, such impacts are expected to be minimal and are expected to mirror the level of the impacts expected to occur at year 50 of the Plan. Impacts associated with removal of that habitat are expected to be balanced by the benefits associated with existence of that habitat over time.~~

DEIS; pg. 4-133: *new Section added:*

4.14.13 PHASE II

Background. The second phase of the Proposed Plan is modeled after the "Safe Harbor" concept. It is designed to remove a disincentive to provide habitat. To the extent that habitat conditions exceed the Safe Harbor Baseline (as described in the HCP) for a species, the Permit would continue after Phase I to authorize incidental take of that species for up to an additional 50 years (hereinafter "Phase II"), or until this voluntary contribution of habitat is reduced to the Baseline amount. This provision pertains to the Permit Species now listed, and Plan Species that become listed in the future, and are associated with those habitats being provided.

If Phase I terminates at the end of the 50 year Permit period, the Baseline would be defined as the amount of habitat projected to exist at year 50 as described in the HCP, as the same may be amended from time to time. If Phase I ends prior to the end of the 50 year Permit period, the Baseline would be defined as the greater of the amount of habitat existing at the beginning of Phase I or that amount projected to exist at the time of termination at year 50. Habitat in excess of the Baseline for a species would be available for harvest during Phase II. This is described in greater detail in Section 5.3.3.

Impacts. Since no take of listed species would be authorized under Phase II except to the extent habitat conditions exceed the Baseline for a specific species, it is expected that the biological and physical conditions during Phase II should at a minimum mirror the conditions described for year 50. To invoke Phase II, the Applicant would maintain habitats above the Baseline for the affected species. The worst-case scenario is that the voluntary contribution would be negligible (i.e., habitat amounts would be equal to those projected for year 50) in which case, take would also be negligible.

Habitat conditions are expected to improve over the long-term for Federal lands in the Planning Area. However, for the purposes of this analysis, it is assumed that all such improvement would cease at year 50. Habitat amounts calculated by using the 90 percent factor across the board is also a worst-case scenario. With the exclusion of catastrophic events, the total amount of potential forested habitat should remain constant. Current levels of nonforested habitat (e.g., lakes, rock, and ice) comprise approximately 8 percent of the subject properties. Harvesting of mature stands would result in conversion to an earlier seral stage, but would not reduce the total acreage of habitats available. Therefore, actions taken by the Applicant cannot reduce the habitats to 90 percent of projected levels for all forested stand structures simultaneously. However, Table 32 of the HCP (see FEIS Appendix 4) presents the amounts of habitats available to most Lifeforms, assuming reduction to 90 percent was possible "across-the-board".

Should early termination occur, conditions must exceed year 1996 or 2045, which ever is greater, in order to utilize Phase II. Therefore, conditions depicted at year 2045 for each Phase II species would always be exceeded. The analyses presented in the HCP for Phase I as they pertain to years 1996 and 2045 are therefore incorporated herein by reference.

Phase II impacts are minimized and mitigated in several ways. First, actions conducted during Phase I will benefit many species. These benefits will be realized by unlisted as well as listed species and many currently unlisted species are expected to benefit from the actions occurring in Phase I. Second, the level of "take" expected is variable and is dependent on the amounts of habitat voluntarily provided over time. Management decisions made by the Applicant may result in habitat amounts which exceed the baseline. The value derived from these habitats will depend on the amount by which they exceed the Baseline and the length of time those habitats are present. Maintenance of habitat above the Baseline is considered mitigation. The level of mitigation will depend on the amounts of habitat and the length of time over which they are provided. In the case of Phase II, the mitigation must, by its very nature, occur in advance of the take. Lastly, "direct take" and reproductive-season impacts would be avoided. Avoidance of these impacts should help substantially reduce the level of impact associated with Phase II.

Should additional habitat be present during the later stages of the Permit period, the incentive for the Applicant, absent any special provisions, would be to reduce habitat to levels projected for the end of Phase I, particularly if Federal law at that time provides that habitat modification or disturbance may be a form of incidental take of listed species. The Services believe that it is in the best interest of the listed species to have a positive incentive to attract and maintain species and to improve wildlife habitat during and beyond Phase I of the HCP. For example, if the Applicant exceeds the projections for NRF habitat prior to completion of Phase I, it would be allowed to maintain that habitat for some period of time without fear of additional Federal restrictions. In the absence of Phase II, the Applicant would have to decide whether to harvest that habitat prior to the end of Phase I or risk foregoing those profits. It is in the best interest of the resources to provide the flexibility that Phase II offers. For these reasons, Phase II offers advantages beyond those of a 50-year Phase I.

As a further assurance that impacts will be minimal, several provisions exist. In the event of early termination, a comparative standard will be used to determine the Baseline. This will result in a very high Baseline for most species. In the event of completion of Phase I, the Services are provided an opportunity at year 40 for further analysis as to whether Phase II is warranted for the requested species. In addition, the Services retain the ability to invoke Extraordinary Circumstances at any time. Together, these provisions afford the Services assurance that impacts will be minimal and will be exceeded by the benefits accrued.

Clarification to last paragraph
Land sales and exchanges, as well as large-scale natural events, are all likely to occur during ~~a 50-year~~ the Permit period.

5.0 LIST OF PREPARERS

DEIS; pg. 5-1: *One preparer's name which was inadvertently omitted in the DEIS is added:*
Team Leaders
Steve Landino, National Marine Fisheries Service, Habitat Branch

6.0 DISTRIBUTION LIST

(NO CHANGE, See Distribution Report)

7.0 ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

(NO CHANGE)

8.0 LITERATURE CITED

DEIS; pg. 8-8:

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Herter, D.R., L.L. Hicks, and B. Melton. 1995. Review process for spotted owl site centers in the Plum Creek Cascades HCP Project Area. Plum Creek Timber Company, L.P., Tech. Rept. No. 3. Seattle, Washington. 29 pp.

Hicks, L.L. and ~~D.R. Herter~~ H.C. Stabins. 1995. Spotted owl ~~dispersal~~ habitat~~: east side Washington Cascades.~~ descriptions for Plum Creek's Cascades HCP. Plum Creek Timber Co., L.P., Tech. Rept. No. 4. Seattle, Washington. In preparation.

Licht, L.E. 1986. Food and feeding behavior of sympatric red-legged ~~*frogs*~~ frogs, *Rana aurora*, and spotted frogs, *Rana pretiosa*, in southwestern British Columbia. Can. Field-Nat. 100:22-31.

DEIS; pg. 8-10:
Lundquist, R., ~~V.S. Kelly,~~ S.T. White, V.S. Kelly, and R. Fleming. 1995. Assessment of special emphasis wildlife species and other wildlife species of concern for the Plum Creek Habitat Conservation Plan. Plum Creek Timber Co., L.P., Tech. Rept. No.8. Seattle, Washington. 74 pp.

DEIS; pg. 8-12:
Oliver, C., R. Greggs, S. Boyd, and L.L. Hicks. 1995 Forest stand structural classification system developed for the Plum Creek habitat conservation plan. Plum Creek Timber Company, L.P., Tech. Rept. No. 10. Seattle, Washington. 30 pp.

Jeffrey, R. 1989. The band-tailed pigeon: distribution, effects of harvest regulations, mortality rates, and habitats, 1968-1979. Unpublished Rept. to Washington Dept. Wildlife, Olympia, Washington.

Sanderson, G.C. (Ed.) 1977. Management of migratory shore and upland game birds in North America, International Assoc. Fish and Wildlife Agencies. Washington, D.C.

9.0 APPENDICES *(NO CHANGE)*

10.0 INDEX *(new section)*

REVISED DEIS FIGURES AND TABLES

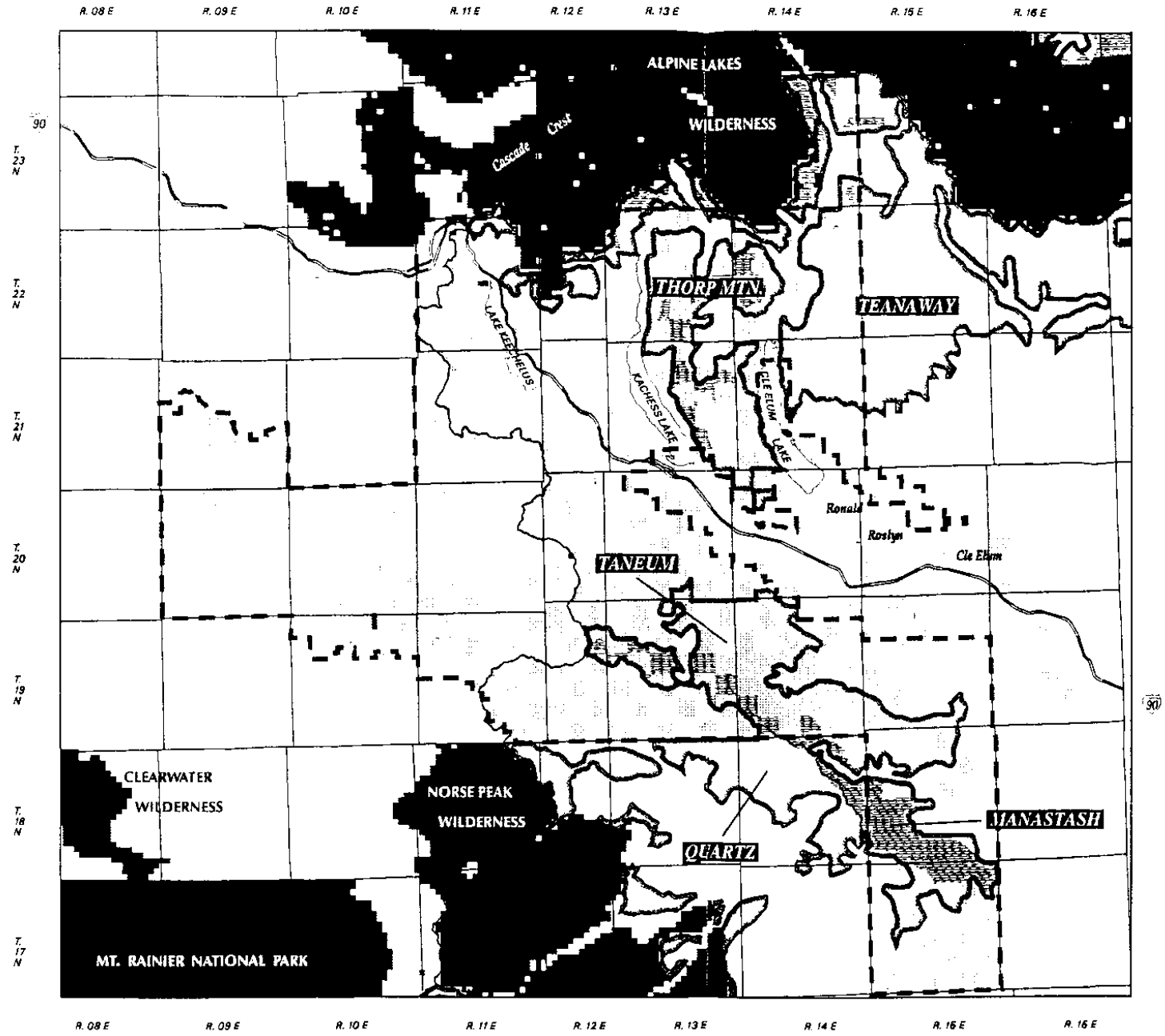

FIGURE 1

CENTRAL CASCADES OF WASHINGTON INCLUDING PLUM CREEK'S HCP AREA

DRAFT ENVIRONMENTAL IMPACT STATEMENT
For the Proposed Issuance of a Permit
to Allow Incidental Take of Threatened
and Endangered Species (11/95)

LEGEND

- PCTC Ownership
- Wilderness Areas
- Unroaded Areas within Inventoried Roadless Areas
- Cascades Habitat Conservation Area
- Inventoried Roadless Areas

Map Prepared By:
The BRODIE Group, Inc. &
Resource Mapping & Management
Date of Plot: March 06, 1996

0 1 2 3 4 5 6 Miles

PROJECT LOCATION

NORTH

This map has been adapted from the Mt. Baker-Snoqualmie and Wenatchee National Forest Service maps (1989).

Table 5. Acres of Land ownership in the Planning Area.

Designated Area and Matrix	USFS		Plum Creek		Other		Water		Total (Acres)
	Acres	%	Acres	%	Acres	%	Acres	%	
Congressionally Reserved Area	8,307	4.1	17	0.0	13	0.0	0	0.0	8,337
Late-Successional Reserve	55,256	27.4	40,647	23.7	2,261	5.5	0	0.0	97,564
Adaptive Management Area	90,051	44.6	67,129	39.7	13,155	32.0	6,633	100	176,968
Managed Late-Successional Area	45	0.0	0	0.0	0	0.0	0	0.0	45
Administratively Withdrawn Area	5,045	2.5	13	0.0	701	1.7	0	0.0	5,759
Matrix	43,097	21.4	33,158	19.8	4,613	11.2	0	0.0	81,228
Not Designated	0	0.0	28,453	16.8	20,335	49.6	0	0.0	48,788
TOTALS	201,801	100	169,177	100	41,078	100	6,633	100	418,689
Percent of Total Planning Area	48.2		40.4		9.8		1.6		

NOTE: USFS - U.S. Forest Service
Designated Areas and Matrix applicable to Federal lands only

Source: Plum Creek Timber Company (PCTC) Cascades Habitat Conservation Plan (HCP) 1995, Geographic Information System (GIS) Analysis (cited hereafter as PCTC HCP GIS Analysis)

SECTION 3.0

INDEX TO THE FEIS

INDEX TO THE FEIS

SECTION 4.0
APPENDICES

APPENDIX 1
DEIS Distribution Report
and
FEIS Distribution List

Note: names in bold and italics received the DEIS document. All others received the Executive Summary of the HCP and DEIS.

1.0 DEIS DISTRIBUTION REPORT (As of March 25, 1996)

1.1 FEDERAL

DEPARTMENT OF AGRICULTURE

James Lyons, Under Secretary - Natural Resources & Environment
Tom Tuchman, Director - Office of Forestry & Economic Development

U.S. Forest Service

Mt. Baker/Snoqualmie National Forest
Dennis E. Bschor, Forest Supervisor
Rudy Edwards, North Bend District Ranger
Mariann Armijo

Catherine Stephenson, Cle Elum District Ranger
Jim Bannister, Cle Elum
John Lemkuhl, Cle Elum
Tony Lukle, Cle Elum
John Morrow, Cle Elum
Keith Kistler, Cle Elum

Wenatchee National Forest
Sonny O'Neil, Forest Supervisor
James Pena, Naches District Ranger
Colin Leingang

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National Oceanic & Atmospheric Administration
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Curt Smitch, Asst. Regional Director, HCP Program Office
Washington, D.C. Office
Portland, OR Regional Office
Olympia, WA Field Office

U.S. ENVIRONMENTAL PROTECTION AGENCY
Region 10
Ruth Siguenza, Environmental Review

BUREAU OF RECLAMATION
Walter Larrick, Yakima Project Office

U.S. SENATE
Washington Delegation
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The Honorable Patty Murray

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Dean Judd, Coordinator, Governor's Timber Team

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Rick Cooper, HCP Director
Steve Bernath, Forest Practices Division
L. Beusan
C. Gallagher
T. Robinson
D. Theoe
S. Trettevich

DEPARTMENT OF ECOLOGY

D. Roberts, Water Quality Program
S. Butkus, Water Quality Program
C. Hall, Yakima
C. McKinney, Yakima
J. Thompson, Yakima

DEPARTMENT OF FISH AND WILDLIFE

Bob Turner, Yakima
Brent Renfrow, Yakima
Gary Engman, Region 4, Habitat Biologist
David Whipple, HCP Coordinator

STATE HISTORIC PRESERVATION OFFICER
Office of Archeology & Historic Preservation
Mary Thompson
David Hansen

1.3 COUNTY
KITTITAS COUNTY COMMISSIONERS
Ray Owens, Kittitas County Commissioner
Mary Subert, Kittitas County Commissioner
Don Sorrenson, Kittitas County Commissioner
Mark Carey, Planning Director, Kittitas County Commissioners
Amy Tonsley - Planning Office

KING COUNTY
Bob Derrick, Director, Department of Development & Environmental Services
Larry Phillips - King County Council
Cynthia Sullivan - King County Council

1.4 LOCAL
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Floyd Rogalski

CITY OF ELLENSBURG
Larry Mattson, Ellensburg Planning Commission

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Jack Denning, Mayor

CITY OF SEATTLE
Jim Erckmann, Water Department, Cedar River Watershed
Keith Kurka, Water Department

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Jim Devere, Mayor

CITY OF TACOMA,
Dick Ryan, Water Supply/Watershed Forester, Tacoma Public Utilities
Dennis Ellison, Water Quality, Tacoma Public Utilities

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Muckleshoot Tribe
Virginia Cross, Chairperson
Martin Fox

Nisqually Tribe
Ed Salminen

Northwest Indian Fisheries Commission
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Quinault Tribe
Bruce Jones

Skallam Tribe
Mike Reed

Tulalip Tribe
Paul Kennard

Yakama Indian Nation
Melissa Rowe
Carrie Jo Meneinick - Jones, Division of Natural Resources
Eric Hanson
Carroll Palmer
Lee Hoppis

1.6 ORGANIZATIONS
ENVIRONMENTAL AND RECREATIONAL
ALPS
Len Gardner, President

American Rivers
Loraine Bodi, Co - Director, Regional Office

Audubon Society
Jim Pissot, Director
Len Steiner
Janna Treisman

Bullitt Foundation
Emory Bundy

Defenders of Wildlife
William Snape III

Environmental Defense Fund
Michael Bean

Federation of Fly Fishers
Pete Soverel

Inland Empire Public Lands Council
John Osborn

Long Live the Kings
John Sayre

Mountaineers
Craig Rowley, President
Dyche Kinder

Mountains to Sound Greenway
Nancy Keith, Executive Director
Ken Konigsmark

National Water Resources
James Trull, President

Nature Conservancy
Elliott Marks, Director

North Cascades Conservation Council
M. Goldsworthy

Northwest Ecosystem Alliance
David Werntz

Northwest Friends of the Earth
David Ortman

Northwest Motorcycle Association
Ron Mogenthaler
Scott Taylor

Pacific Northwest Four Wheel Drive Association
Carol Jensen

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Willa Nehlson

Quinault Management Center
Gary Morishima

Save Our Salmon
Tim Stearns

Sierra Club-Cascades Chapter
Charles C. Raines, Director Checkerboard Project

Trout Unlimited
Frank Urabeck, Vice President, Western Washington

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Joan Crooks

Washington Native Plant Society
Jerry Davison

Washington State Snowmobile Association
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INDUSTRY ASSOCIATIONS

Washington Forest Protection Association
Bill Jacobs

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Chip Murray

National Forestry Association
Bob Dicks

Society of American Foresters
Neal Hart

MEDIA

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Daily Olympian
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Ellensburg Daily Record
Pat Woodell
Mike Johnson

Everett Herald
Sharon Salger

King TV
Scott Miller

KPLU
Jennifer Schmidt

KTCS - TV 9
Gary Harikawa

North Kittitas Country Tribune
Mike Gallagher

Peninsula Daily News
Steve Powell

Seattle Post- Intelligencer
Rob Taylor
Mindy Cameron

Seattle Times
Eric Pryne
Don Hanula
Ross Anderson
Terry Tang

Spokesman Review
Julie Titone

Tacoma Morning News Tribune
Leslie Brown

Yakima Associated Press
Aviva Brandt

Yakima Herald Republic
Joe Rose

1.7 UNIVERSITIES/LIBRARIES

UNIVERSITIES

Univeristy of Montana

Dan Pletcher, Wildlife Biology Program, School of Forestry
John Gangemi

University of Washington

Jerry Franklin, Ph.D.
Justin Hall, PAC Forest

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University of Washington Library
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King County Library - North Bend
Enumclaw Public Library

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Glen Aurdahl

Mitch Baker
Ellie Belew
Dick Best
Melanie Bojanowski
Brian Boothe
Gordon Bradley
Jim Brady
David Bricklin
Mary Burke

Colores Castillo
Jina Chan
Jim Chapman
Janet Coit

Bill Dallmeyer
Poppy Davis
Art Day
Heather Deal

Mr. Eberhart
Eric Edsinger
Wesley Engstrom
Maria Elijah

Sen Finn
Henry Frasier

John Gangemi
Nancy Geboski
Kevin Geraghty
Max Gollodey
John Gorman

Perry Hagenstein
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Jeff Hallo
Elisa Hampton
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Becky Herbig
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Janet Hope
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Tom Stewart
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Brendon Swedlow

Liz Tanke
Cindy Thieman
John Titus
Elissa Torres
Mike Town
Bob Tuck

Morris Ubelacker

Dan Varland

Robert Wattez
Bob Weeks
Robert Wininger

Cindy Young

1.9 CONTRIBUTORS TO THE HCP DOCUMENT

Plum Creek Timber Company, L.P.
Raedeke Associates, Inc.
National Council for Air and Stream Improvment
D.R. Systems, Inc.
Brodie Group
Perkins-Coie

2.0 FEIS DISTRIBUTION LIST

2.1 FEDERAL

DEPARTMENT OF AGRICULTURE

U.S. Forest Service
- John Morrow
- Sonny O'Neil

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 10 - Richard Parkin

U.S. DEPARTMENT OF COMMERCE
- NOAA
- NMFS

U.S. DEPARTMENT OF INTERIOR
- USFWS

FEDERAL LEGISLATORS
- The Honorable Slade Gorton
- The Honorable Patty Murray
- The Honorable Rick White
- The Honorable George Nethercutt
- The Honorable Jack Metcalf
- The Honorable Norm Dicks
- The Honorable Jennifer Dunn
- The Honorable Doc Hastings
- The Honorable Randy Tate
- The Honorable Linda Smith

LEADERSHIP/COMMITTEES
- James Tate, Jr. - Senate Committee, Environment

2.2 STATE

DEPARTMENT OF FISH AND WILDLIFE
- Bob Turner

STATE LEGISLATORS

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Representative Gary Chandler
Representative Steve Fuhrman
Representative Joyce Mulligan
Representative Barney Beeksma

2.3 COUNTY

Kittitas County Commissioners
Ray Owens
Mary Subert
Don Sorrenson

Ellensburg Planning Commission
Larry Mattson

Yakima Basin Joint Board
Patrick Monk

2.4 CITY

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Floyd Rogalski
Gary Berndt

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City of Ellensburg
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City of Roslyn
Jack Denning

2.5 TRIBAL

Muckleshoot Indian Tribe
Karen Walter
Isabel Tinoco

Northwest Indian Fisheries Commission
Janet Burcham

PuyallupTribe of Indians
Jeff Thomas

Tulalip Tribe
Daryl Williams

Yakama Indian Nation
Carroll Palmer

2.6 ORGANIZATIONS
ENVIRONMENTAL AND RECREATIONAL

ALPS
Len Gardner

Audubon Society
Beverly Blinn
Timothy Cullinan
Marianne Gordon
David Jennings
Bonnie Phillips-Howard

Central Cascades Alliance
Jay Letto

Defenders of Wildlife
William Snape III

Environmental Defense Fund
Michael Bean

Kettle Range Conservation Group
Timothy Coleman

Mountaineers
Craig Rowley

Northwest Ecosystem Alliance
David Werntz

Northwest Motorcycle Association
Scott Taylor

Pacific Forest Trust
Daniel Hall

River Council of Washington
Brook Drury

Sierra Club-Casacade Checkerboard Project
Charlie Raines

Washington Environmental Council
Toby Thaler

Washington Native Plant Society
Jerry Davison

Wilderness Society
Steve Whitney

INDUSTRIAL

Northwest Forest Association
Bob Dick

Washington Forest Protection Association
Bill Jacobs

2.7 UNIVERSITIES / LIBRARIES

University of Washington
Dr. Jerry Franklin (Forest Resources)
Dr. Gordon Orians (Zoology)
Dr. Estella Leopold (Paleobotany)

University of Montana Library
University of Washington Library
Wenatchee Public Library
Seattle Public Library, government Publications Department
Evergreen State College Library
Central Washington University Library
King County Library System - Bellevue
King County Library - North Bend
Enumclaw Public Library

2.8 INDIVIDUALS

Mitch Baker
Ellie Belew
John Bigas
Melanie Bojanowski
Brian Booth
Mark Boyar

Brad Carlquist
Jim Chapman

Arthur Day

Henry Fraser

Bob Harns
Stan Haye
Ben Hayward
Becky Herbig
Lucie Huong

Will Johnson

Keith Kistler

Mark Lawler
Joe Leysath
Troy Locati

Donald & Linda Parks
Susan Parr
Randy Payne

William Scott
Edward Scullywest
Donald Seaman
Stan Sovern
Brenda Senturia
Edward Syrjala

Liz Tanke
Don Theoe
Cindy Thieman
John Titus
Mike Town

Morris Ubelacker

Robert Wattez
Bob Weeks

2.9 CONTRIBUTORS TO THE HCP MODIFICATIONS

Plum Creek Timber Company, L.P.
Raedeke Associates, Inc.
Brodie Group
Perkins-Coie

APPENDIX 2

DEIS List of Commentors and Services' Response to Comments

This appendix consists of three sections: (1) a listing of the commentors responding to the draft EIS for the Proposed Issuance of a Permit to allow incidental take of Threatened and Endangered Species on Plum Creek Timber Company, L.P. lands in the I-90 corridor, King and Kittitas Counties, Washington; (2) the comment category outline; and (3) the Services responses to public comments by category.

The public comment period for the draft EIS began on November 17, 1995 and closed on January 22, 1996. Federal and State agencies, Tribes, environmental organizations, officials, and the public were invited to comment on the draft EIS. A complete listing of the agencies, organizations, and individuals receiving the draft EIS is shown in Appendix 1.

During the public comment period, 166 letters and 424 preprinted cards, representing 737 individuals were received. Among the total comments received, most were either form or modified form letters/cards, and the remainder were letters or small reports prepared by agencies, Tribes, environmental organizations, or individuals. While the vast majority of comments came from Washington State, comments were also received from Washington, D.C., Georgia, Oregon, California, and Wyoming.

Section C of this appendix contains the Services' responses to public comments. After analyzing the comments, the Services summarized related topics into categories to avoid cumbersome text duplication, then responded to the concerns expressed in the comments.

Note that many of the comments addressed herein are clearly directed at the HCP. To be certain that they were adequately addressed since they relate to the Proposed Plan (Preferred Alternative), the Services treated them as NEPA comments in this document. Those comments will be further treated in any HCP decision documents which may be prepared as a result of this proposal.

A. LIST OF COMMENTORS

Federal Agencies

U.S. Environmental Protection Agency, Richard B. Parkin
U.S. Forest Service, Wenatchee National Forest, Sonny J. O'Neal

State Agencies

Washington State Department of Fish and Wildlife, Robert Turner

State Congressional Delegation
Washington House of Representatives, Barney Beeksma
Washington House of Representatives, Jim Buck
Washington House of Representatives, Gary Chandler
Washington House of Representatives, Joyce Mulliken
Washington House of Representatives, Steve Fuhrman
Washington House of Representatives, Ken Jacobsen

Universities
University of Washington, Jerry F. Franklin, Ph.D.

Indian Tribes
Muckleshoot Indian Tribe, Isabel Tinoco
Muckleshoot Indian Tribe, Karen Walter
Northwest Indian Fisheries Commission, Janet Burcham
Northwest Indian Fisheries Commission, Bruce Davies
Puyallup Tribe of Indians, Jeffrey Thomas
The Tulalip Tribes, Daryl Williams
Yakama Indian Nation, Carroll Palmer

State Cooperative
Yakima Basin Joint Board, Patrick A. Monk

Environmental Organizations
Defenders of Wildlife - Washington D.C., ,William J. Snape, III
National Audubon Society, Timothy P. Cullinan
Central Cascades Alliance, Jay Letto
Environmental Defense Fund, Michael J. Bean
North Cascades Conservation Council, Rick McGuire
Northwest Ecosystem Alliance, Dave Werntz
Rivers Council of Washington, Brooke M. Drury
Sierra Club - Checkerboard Project, Charles C. Raines & Associates
Sierra Club - California, Kathy Bailey
The Wilderness Society, Steven Whitney
Washington Environmental Council, Toby Thaler
Washington Native Plant Society, Jerry Davison
Alpine Lakes Protection Society, Len Gardner
Black Hills Audubon Society, David Jennings
Friends of the Green River, Patricia Sumption
Kettle Range Conservation Group, Timothy J. Coleman
Kittitas Audubon Society, Marianne Gordon
Pilchuck Audubon Society, Bonnie Phillips
Rainier Audubon Society, Beverly Blinn
Ridge, Ellie Belew
The Mountaineers, Craig Rowley

Recreational Organizations
Issaquah Alps Trails Club, William Longwell
Northwest Motorcycle Association, Scott Taylor
Washington Trails Association, Ira Spring

Industry Associations
Northwest Forestry Association, Malcolm R. Dick
Washington Forest Protection Association., William C. Jacobs

Interested Individuals
Heather Anderson

Charles M. Bagley, Jr.
Mitch Baker
Christa Barke
Arleno Bell
Rebecca A. Benton
Mary Bicknell
Paul Blodgett
Rosemary Bodien
Melanie Bojanowski
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Babits Faires-Selby
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Greg D. Latimer
Mark Lawler
Joe Leysath
Hal Lindstrom
Troy Locati
John A. Lombard
Autumn M. Lovejoy
David L. Lutschg

Chris A. Magill

E.D. Markham

Michael Marsh, Ph.D.
Anne Martin
Lauris C. Mattson
Joelle Mauthe
J.C. May
Jeff McGrath
Jill McGrath
Mavra McLoughlin
Kevin T. Moore
John E. Morrow

Warren Northrop

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Mark Ostersmith

Sheila Parker
Donald and Linda Parks
Susan M. Parr
Randall D. Payne
Tom Pierce
Diane Porter-Gibbins
Douglas Post
Avis Rana
Robert Rhodes
Robert E. Rutkoeski
Edward S. Scullywest
Brenda Senturia
Birgit Seuesrott
Chandra Shah
Jon Shemerdiak
Paul Sisson
Donald D. Snow
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Paul Spitalny
Richard Stebetee
Denise Stotsenberg
R.S. Swenson

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Cindy Thieman
Richard E. Tinsley
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Jordan Van Voast
John J. Villa
Joseph I. Vincent
Linda Ann Vorobik, Ph.D.

Robert Wattez
Carol G. Watts
Robert Weeks
Kurt Weiland
Julia Welde
Gary L. Westerlund
Adam Wexler
Katy Willdard
Grant M. Woodfield
Scott Wotipka

Haruko Yurky

Kaffb Zohn

424 pre-printed cards
(477 signatures)

B. RESPONSE CATEGORY OUTLINE

C. SERVICES' RESPONSES BY CATEGORY

I. GENERAL COMMENTS

Comment Summary:
In total, the Services received comments from the Environmental Protection Agency (EPA), the Wenatchee National Forest, Washington Department of Fish and Wildlife (WDFW), six members of the State House of Representatives, one professor at the College of Forest Resources (University of Washington), eight letters from five Tribes and tribal organizations, two national conservation organizations, eight State environmental organizations, 17 local organizations (one of which contained a petition signed by 82 people), two industry organizations, and the Yakima Basin Joint Board. The Services also received 118 letters from 122 individuals.

House of Representative members and the industry organizations supported the HCP; EPA, Wenatchee National Forest, WDFW, and tribal organizations made suggestions; Defenders of Wildlife offered general support with suggestions; environmental groups generally opposed the Plan as it was proposed - some were strongly opposed to it while others requested modifications; most individuals either strongly opposed the Plan or requested modifications - only a few individuals were supportive; and a professor at the College of Forest Resources (University of Washington) supported the Plan. A number of commentors remarked on the wildlife value of the Planning Area.

Services' Response:
The Services recognize these comments. Regarding the last comment, the Services agree that the Planning Area is important for landscape connectivity in the central Cascades (see other Responses below that address Connectivity and General Wildlife).

II. DESCRIPTION OF AREAS

A. Location and Boundaries

Comment Summary:
The Muckleshoot Indian Tribe, Defenders of Wildlife, North Cascades Conservation Council, Rivers Council of Washington, Sierra Club-Cascade Checkerboard Project, six local organizations (including a petition signed by 82 people), and 77 individuals (letters) and 477 individuals (424 preprinted cards) commented that Plum Creek's Cle Elum River property should be added to the HCP, is an important area for wildlife and other values, or is in a critical strategic location. One individual commented that the HCP should include the Cle Elum River property as an "Adaptive Management Area". The Sierra Club-Cascade Checkerboard Project also commented that other lands in King and Kittitas Counties should be included as well and says "gerrymandering" is not good.

Services' Response:
The Applicant prepared the HCP voluntarily to address specific species conservation and ecosystem management options for Company owned forest lands in the central Cascade Mountains. The conservation planning process enabled in section 10(a)(1)(b) of the ESA is entirely a voluntary process. Many decisions

regarding plan design, including which species and lands the Applicant wants covered, are Applicant driven decisions. The Applicant has indicated that it excluded the Cle Elum River property from the HCP for several reasons. First, all properties owned by the Applicant in the HCP Planning Area have been designated as forest lands of long-term commercial significance, by Kittitas County, with commercial forestry as the primary land use. As such, these lands have been included in Applicant's long-term strategic forest management plan. However, the Cle Elum River property has not been designated as forest land of long-term commercial significance by Kittitas County and is not considered by the Applicant to be suitable as forest land of long-term commercial value. Second, the property is not required for the long-term biological success of the Planning Area. Finally, the Applicant does not intend to retain ownership of these lands for the duration of the Permit period, and therefore, these lands have been excluded from the Applicant's long-term strategic forest management planning.

Although the Cle Elum River property is not included in the HCP, these lands would continue to be regulated under section 9 of the ESA and State law. Furthermore, the Applicant is actively engaged in ongoing wildlife research and fish habitat restoration activities on these properties. These properties are experiencing problems associated with forest health and unauthorized recreational and off-road vehicle use. The wildlife values are therefore considerably less than indicated in many comments.

B. Area Size

Comment Summary:
One individual commented that the HCP, due to the checkerboard ownership pattern, would actually have an effect on 250,000 acres of land, not just the 169,177 acres of Plum Creek ownership.

Services' Response:
The Applicant has considered a Planning Area greater than 400,000 acres, however, the HCP only covers the lands owned by the Applicant. In addition, because of the intermingled ownership in the Planning Area, the Applicant designed the HCP to be consistent with the goals and objectives of applicable Federal forest management efforts (HCP Section 1.5; Federal Land Management Strategy and Section 1.6; Consistency With Federal Regulations). For example, the HCP includes ecosystem-based strategies, as recommended by the Northwest Forest Plan (HCP Section 1.5.1), that are consistent with Federal objectives for the conservation and recovery of listed species (HCP Section 3.0). In addition, the HCP incorporates the biological goals and objectives, recommended in the final draft Recovery Plan for the Northern Spotted Owl, for non-federal lands in Designated Conservation Areas (DCAs) in the Planning Area (HCP Section 1.4; Historical Spotted Owl Management).

The Applicant recognized early in the process that its activities in the Planning Area could affect other non-federal and Federal ownerships. Therefore, the objective was to develop a spatially referenced database for all lands within the Planning Area, including land not managed by the Applicant. Coordination of databases and assumptions regarding non-federal landowners is discussed in HCP Sections 2.6.3 (Other Landowner's Databases); 2.6.4 (Other Landowner Coordination); and 2.6.5 (Assumptions). Coordination with Federal agencies with jurisdiction of land in the Planning Area is discussed in HCP Sections 2.6.5.1 (Primary Assumptions on Federal Lands) and 2.6.5.2 (Secondary Assumptions on Federal Lands).

C. Climate

Comment Summary:
The National Audubon Society and one local organization suggested that the HCP and DEIS should evaluate "climatological phenomena" and that the effects of global warming could change the entire forest dynamic.

Services' Response:
Climatological phenomena and/or other phenomena or events which could materially change the entire forest dynamics, and otherwise warrant a revision of the HCP under section 10(a) of the ESA is addressed in the HCP under Section 5.3.1 (Unforeseen Circumstances) and Section 5.3.2 (Extraordinary Circumstances), and in the Implementation Agreement under Sections 7.0 (Amendments) and 8.0 (Unforeseen and Extraordinary Circumstances). However, due to retention and regrowth of trees and other vegetation, the net effect on the global carbon budget is expected to be practically zero.

D. Other Characteristics of the Area

Comment Summary:
The Muckleshoot Indian Tribe and Sierra Club-Cascade Checkerboard Project commented on possible errors in the characterization of the Planning Area. The comments addressed landownership on DEIS Figures 1 and 2 and roadless area boundaries on DEIS Figure 1.

Services' Response:
Land ownership information used to create DEIS Figures 1 and 2 was obtained by the Applicant from a variety of sources including the National Forests, City of Tacoma, Washington Department of Natural Resources, King County, and other private landowners. Most of the slight discrepancies in land ownership data can be traced to one of the following: (1) recent sale or acquisition of lands by other owners; (2) exchange of lands between other private landowners and the Forest Service; (3) Applicant's ownership of timber rights on lands not owned by the Applicant; and/or (4) inadvertent mis-labeling of ownership by one or more data sources. Regardless of the reason for the discrepancy, acreage associated with these variations is small and would not affect impacts and implementation of the HCP. Roadless area boundaries were reviewed by the Applicant and roadless areas adjacent to the Alpine Lakes Wilderness Area were not correctly delineated. In fact, it appeared that the Alpine Lakes Wilderness Area was a roadless area in its entirety. DEIS Figure 1 has been revised and included in the FEIS to accurately reflect the information available from the GIS Department of the Wenatchee National Forest. In addition, Figure 1 now reflects the unroaded areas which are considerably less that the roadless areas. Specifically, in the Planning Area, roadless areas comprise 86,975 acres while the unroaded acres are 19,930.

III. ABIOTIC ISSUES

A. Air Quality

Comment Summary:
One individual commented that considerable leeway could be given to Plum Creek in matters of air pollution in achieving targets, as long as it works.

Services' Response:
In accord with HCP Section 1.2.3 and the commitment in the Implementation Agreement, the Applicant would comply with all applicable State and Federal regulations regarding air quality.

B. Soils

Comment Summary:
One individual commented that incorporating more selective harvest methods into the HCP strategies should be a priority to maintain the structural and organic components of the forest floor and soil.

Services' Response:
Selective and partial harvesting techniques are components of the HCP strategy. As mentioned in the HCP (see Section 3.0), selective and partial harvesting would likely constitute between 80 and 85 percent of the harvesting on the east side of the Cascades and between 30 to 35 percent on the west side. All harvest activities on the Applicant's lands in the Planning Area would require a Forest Practices Notification or Approval from the DNR; the issuance of which is contingent upon compliance with provisions of the Washington Forest Practices Act (RCW 76.09) and implementing Forest Practices Rules and Regulations (WAC 222-010). The Services believe that the measures discussed in the HCP under Section 1.2.3.1 (Harvest Methods); 1.2.3.2 (Reforestation); 1.2.3.3 (Growth Enhancement and Maintenance); 1.2.3.4 (Road Building and Maintenance); and 1.2.3.5 (Watershed Analysis) all appropriately address the issue.

1. Stability

Comment Summary:
The Northwest Indian Fisheries Commission and Puyallup Tribe of Indians commented that nonfish-bearing perennial and intermittent streams should have adequate buffers to prevent mass-wasting events and erosion; the Tulalip Tribes recommended that landslide potential be inventoried for all existing forest roads and for future road engineering standards to be specified; and the Northwest Indian Fisheries Commission commented that the HCP strategy for nonfish-bearing, perennial streams does not substantially improve on State Forest Practices Rules and Regulations for maintaining bank stability. One individual asked if there are limitations to logging on steep slide prone slopes; one individual commented that additional buffer width is needed on riparian zones for protection from erosion and landslides.

Services' Response:
Existing forest practice regulations include limitations for logging on steep slide-prone slopes (Appendix 5). In addition, the Applicant has agreed, as additional mitigation, to fund and complete watershed analysis in all watersheds in the Planning Area. This watershed analysis (scheduled for completion in 5 years after Permit issuance) would be used to identify these steep, sensitive areas. Most prescriptions for these areas (e.g., inner gorges) include riparian buffers that generally prohibit harvesting and road construction. The landslide potential for existing forest roads and future roads would be inventoried and addressed by the Applicant through the commitment for conducting watershed analysis throughout the Planning Area and through the development and implementation of road maintenance and abandonment plans. The 100-foot RHA on nonfish-bearing, perennial streams, especially in the Yakima Subbasin, is a substantial improvement over State Forest Practice Rules and Regulations and is designed to maintain bank stability (HCP Section 3.3.3.1). In addition, the Applicant has added a 30-foot zone on Type 4 Stream RHAs where ground-based equipment is prohibited to protect stream bank stability.

2. Compaction

Comment Summary:
The WDFW commented that RLTA prescriptions may cause soil compaction resulting in adverse impacts to amphibians. The Washington Environmental Council commented that compacted soils after harvesting support invasive, early-successional plant and animal species and the harvested areas should be restored as part of the replanting process.

Services' Response:
Soil compaction is a serious concern in western Washington. However, it is less of a concern where frost upheavals occur and function to alleviate effects of compaction. In these areas, erosion and mass-wasting become greater concerns. In many cases following harvest and replanting, roads would be abandoned and the road prism ripped to promote regeneration of native vegetation. The addition by the Applicant of a 30-foot, no-equipment zone on all RHAs, including Type 4 streams, would minimize soil compaction in riparian areas that provide habitat for amphibians. Practices to avoid negative impacts to soil and its productivity would be assessed by the Applicant on a site-specific basis and are also addressed in the responses to topics below.

3. Erosion

Comment Summary:
The Yakama Indian Nation and the Puyallup Tribe of Indians and one individual commented on the need to expand buffer widths on nonfish-bearing streams to prevent erosion potential. The Yakama Indian Nation also commented that the HCP does not address erosion from existing roads and road management objectives for new roads are only guidelines and not quantifiable or predictable. The Puyallup Tribe of Indians commented that nonfish-bearing, perennial, and intermittent streams should have adequate buffers to prevent erosion. The Washington Environmental Council commented that "erosion techniques" implemented to maintain a road can have adverse impacts on hydrology, soils, and environment. One local conservation organization commented on the erosion potential from increased road density. One individual was concerned about logging steep, mountainous terrain, and other erosion prone areas. One individual commented that logging under the HCP would occur in inappropriate, erosion-prone areas; one individual commented that larger riparian buffers and selective harvest would protect watersheds from erosion.

Services' Response:
Many of the erosion prone areas with the potential for impacting aquatic resources occur directly adjacent to streams. The RHAs would maintain root strength in some of these erosion-prone riparian areas. The Applicant has also added a 30-foot zone on Type 4 RHAs where ground-based equipment is prohibited to protect stream bank stability, in addition to the 25-foot zone of equipment exclusion in areas with RLTAs (HCP Section 3.3.3.1). RHAs on Type 4 streams have also been added in watersheds with anadromous fish, bull trout, or 303(d) concerns east of the Cascade crest. Moreover, watershed analysis would be used to identify erosion prone areas throughout the Planning Area and provide appropriate prescriptions (HCP Section 3.3.2). Watershed analysis may specify riparian buffers that are wider and/or with more leave trees than the proposed RHAs and RLTAs. Prior to completion of watershed analysis, State Forest Practice Rules and Regulations are in place to prevent forest practices in slide-prone areas (HCP Appendix 5). The Applicant would address erosion from existing and future roads on a more site-specific basis using watershed analysis (see HCP Sections 3.3.2; Watershed Analysis; and 1.2.3.4; Road Building and Maintenance).

C. Water

Comment Summary:
The Puyallup Tribe of Indians commented that monitoring frequency should be increased in each watershed for a variety of water-related issues.

Services' Response:
Watershed analysis (HCP Section 3.3.2; Watershed Analysis) would provide the basis for implementing the ecosystem management objectives of the HCP related to aquatic resources. HCP standards and guidelines would be upgraded for individual watersheds as a result of prescriptions developed from watershed analysis. However, because not all questions about the long-term effects of HCP implementation on water-related issues can be addressed with total certainty today, the Applicant would use an Adaptive Management approach (HCP Section 5.4.2) as a feedback mechanism to evaluate monitoring data and as a basis for determining if corrective actions are necessary, or if the frequency, timing, and/or duration of sampling should be modified. In addition to watershed analysis monitoring, a number of specific monitoring efforts will be conducted as part of the HCP. See HCP Section 5.1.6 Aquatic Resources Monitoring (and revisions in FEIS Appendix 4).

1. Surface Water

Comment Summary:
One local organization commented that the HCP would degrade water quality and one individual commented that riparian protection measures should be improved because these areas are important for water filtration and storage.

Services' Response:
The aquatic conservation strategy in the HCP is designed to minimize impacts on water quality by reducing the potential for erosion and compaction. The RHAs would require limited harvesting near streams so there would be little if any soil disturbance from ground-based equipment. The Applicant has also added 100-foot RHAs on Type 4 streams in watersheds with anadromous fish, bull trout, or 303(d) concerns east of the Cascade crest and prohibited ground-based equipment within 30 feet of these streams. Type 5 streams with the potential for landslides or surface erosion are addressed through a combination of current Forest Practice Rules and Regulations and watershed analysis (see Soil Erosion response).

a. Floods/flow regime

Comment Summary:
The Yakama Indian Nation, the Puyallup Tribe of Indians, and the Northwest Indian Fisheries Commission mentioned that the Applicant needs to maintain instream flow and natural hydrologic regimes in all streams to maintain salmon spawning and rearing habitat. The Washington Environmental Council and one individual were concerned that the HCP would alter hydrology of watersheds in the Planning Area. Two individuals were concerned about protection of Type 4 and 5 streams and existing problems with flow regime changes. Another individual was concerned about protection for intermittent streams and wetlands because they provide important water retention/detention functions. Two individuals were concerned that continued clearcutting in the Planning Area would cause flooding. Another individual suggested that Plum Creek incorporate planning for stochastic events such as floods in the HCP. Another individual requested

information on Plum Creek's existing measurement locations and capabilities to measure 100-year flood events.

Services' Response:
While timber harvesting over large areas has been shown to increase streamflow through most parts of the year, the magnitude of increase is rarely large enough to make a material difference, particularly during floods. Although removal of trees can contribute to flood events, these events are generally driven to a greater extent by climatic events (e.g., heavy rainfall and rapid snowmelt). Flow regime changes in smaller streams that cause accelerated erosion or channel changes would be addressed primarily through watershed analysis. The Applicant has implicitly considered the stochastic potential for floods in the Riparian Management Strategy (HCP Section 3.3) by protecting floodplain and wetland areas through RHAs and watershed analysis prescriptions. Additionally, the Applicant has described measures in the HCP (HCP Section 5.3.1 Unforeseen Circumstances and Section 5.3.2 Extraordinary Circumstances) to address situations such as large scale disturbances that drastically change the landscape. One of the objectives of the strategy is to maintain instream flow and the natural hydrologic regimes (HCP Section 3.3). Watershed analysis completed to date by the Applicant has identified the lack of streamflow data as a major problem. For this reason, the Applicant has installed two stream gages in Taneum Creek to collect better data for feedback to the Adaptive Management Strategy and monitoring prescriptions regarding flood/flow problems and would change practices if warranted.

b. Water temperature

Comment Summary:
The EPA, Yakama Indian Nation, and Puyallup Tribe of Indians commented that stream temperatures are a major concern in the Planning Area and monitoring is the key to determining whether temperatures are within acceptable limits of State water quality standards. The Yakama Indian Nation, Sierra Club-California Chapter, and three individuals commented that RHAs and RLTAs were inadequate to shade streams and prevent water temperature increase. The Yakama Basin Joint Board disagreed with the findings of the Limiting Factors Analysis. They state that ambient temperature, not flow, is the primary influencing factor.

Services' Response:
RHAs would provide a high level of shade retention to maintain cool stream temperatures. All Type 4 streams on the 303(d) list receive 100-foot RHAs and the Applicant has added 100-foot RHAs on Type 4 streams in watersheds with anadromous fish, bull trout, or 303(d) concerns east of the Cascade crest. Monitoring has been proposed to directly test the effectiveness of various Riparian Management Strategies (HCP Section 3.3), including RHAs and RLTAs, on maintaining stream temperatures and meeting State water quality standards (Sections 3.3.5 and 5.1.6). If monitoring data indicate the RLTA approach compromises stream temperatures, prescriptions may be altered in accordance with Adaptive Management principles.

2. Ground Water (supply)

Comment Summary:
One individual urged that additional protection of riparian areas along intermittent streams is needed for ground water retention/detention and slow release during the dry season.

Services' Response:
The primary potential for affecting groundwater retention/detention along streams is from soil compaction due to heavy ground-based equipment. RHAs proposed by the Applicant for perennial, Type 1-4 streams would largely exclude heavy ground-based equipment near streams. Most Type 5 streams would not have soil compaction problems because they occur on steep slopes and would be cable-logged.

3. Water Quality (potability)

Comment Summary:
The EPA requested that the HCP incorporate more in-depth monitoring for changes to water quality related to sediment loading and temperature; the Rivers Council of Washington, one local organization, and one individual commented that increased riparian protection is needed to ensure watershed health, water quality, and downstream human water use.

Services' Response:
The water quality monitoring program proposed by the Applicant would directly measure potential impacts of the HCP on sedimentation and temperature (Sections 3.3.5 and 5.1.6). After discussions with the EPA and the Services, the Applicant agreed to expand temperature monitoring for the Planning Area and testing the effectiveness of riparian treatments (see FEIS Appendix 4, Section 5.1.6). The proposed riparian strategy greatly exceeds current Forest Practices Rules and Regulations, which are designed to ensure good water quality for downstream uses.

IV. BIOTIC ISSUES

A. Forest Health

Comment Summary:
The WDFW, Defenders of Wildlife, National Audubon Society, Sierra Club-Cascade Checkerboard Project, Wilderness Society, Washington Forest Protection Association, eight local organizations, and 49 individuals commented on general forest health issues. Comments included the HCP does not have a strategy to deal with forest health issues, suggestions to develop, in cooperation with the Forest Service, evaluation and management techniques, and that the definition of forest health is too narrow and is only concerned with economic impacts and not the creation of wildlife habitat diversity that forest health problems create. One commentor noted that protection of riparian areas is important for a healthy forest ecosystem and another supported the HCP's coverage of forest health issues. Nutrient cycling was identified as an intricate and important process in older forests and clearcutting and slash burning identified as adversely impacting nitrogen fixing bacteria and mycorrhizal associations.

Services' Response:
The temporal and spatial uncertainty of forest health-related vectors like insects and fire precluded the development of a stand-level site-specific strategy. However, the Applicant plans to use thinning to increase the vigor and resistance of younger forest stands to forest health agents (see HCP Section 3.5.4) Reduction of fuel loads in mature forest stands managed for spotted owl habitat is still problematic, however. The Services currently lack the knowledge to estimate accurately the amount of dead and down wood that can be removed from a stand and still maintain functional spotted owl habitat. As suggested

by some commentors, this issue would be the topic of cooperative research and monitoring with the Forest Service (see HCP Section 5.4.3.4). Comments about the role of tree mortality in providing and maintaining wildlife habitat are accurate, but the forest health issue revolves around the potential for widespread, catastrophic loss of forest diversity which would have a negative effect on spotted owls and other late-successional species. Retention of dead, dying and down trees for wildlife habitat was addressed as a Special Habitat (HCP Section 3.4.4), incorporated into the Managed Old-Growth structural stage (HCP Section 2.3) and would be encouraged in Riparian Habitat Areas (HCP Section 3.3.3.1). The interim and minimum guidelines for RHAs address the concern that functional riparian areas are integral to overall forest health. Concerns that clearcutting and slash burning impact nutrient cycling is not consistent with research that has documented a flush of soil nutrients immediately following timber harvest and opening of the forest canopy (e.g., the Asart Effect).

1. Forest Diseases and Insect Infestations

Comment Summary:

The Defenders of Wildlife, National Audubon Society, Wilderness Society, three local organizations, and six individuals commented on forest diseases or insect infestation issues. The majority of comments suggested that the HCP should better analyze the impacts of forest diseases or insect infestations on habitat and wildlife or account for and compensate for future disease or insect outbreaks and the resultant loss of habitat. One local organization noted that insects and disease increase diversity. One commentor noted that selective harvesting is better at protecting against disease and insect outbreaks than even-aged harvesting which results in homogeneous stands more susceptible to diseases and insects.

Services' Response:

All alternatives were analyzed for potential impacts upon forest health. The Services believe these issues were adequately addressed and any projections of future outbreaks would be remote and speculative. The temporal and spatial uncertainty of forest health-related vectors like insects and fire precluded the development of a stand-level site-specific strategy. However, the Applicant plans to use thinning to increase the vigor and resistance of younger forest stands to forest health agents (see HCP Section 3.5.4.) Comments about the role of tree mortality in providing and maintaining wildlife habitat are accurate, but the forest health issue revolves around the potential for widespread, catastrophic loss of forest diversity which would have a negative effect on spotted owls and other late-successional species. Retention of dead, dying and down trees for wildlife habitat was addressed as a special habitat (HCP Section 3.4.4), incorporated into the Managed Old-Growth structural stage (HCP Section 2.3 and Appendix 7) and would be encouraged in Riparian Habitat Areas (HCP Section 3.3.3.1). In response to concerns about the value of selective harvesting to resist disease and insect outbreaks, more detail was added on management of Ponderosa pine stands (HCP Section 3.4.6), where partial harvest is a silvicultural option. In other types of stands such as Douglas-fir/western hemlock, partial cutting would not permit successful regeneration due to excessive shading. The issue is not even-aged vs. uneven-aged stands but rather density management which reduces stress that can lead to successful insect outbreaks. The Applicant plans to use thinning to increase the vigor and resistance of younger forest stands to forest health agents (see HCP Section 3.5.4) Even-age stands now incorporate a diversity of species which further reduces the potential for widespread damage from insects which attack specific species.

2. Fire and Windthrow

Comment Summary:

The Defenders of Wildlife, National Audubon Society, Sierra Club-Cascade Checkerboard Project, Wilderness Society, eight local organizations, 48 individual letters, and 424 preprinted cards commented

on issues regarding fire and windthrow. The majority of comments stated that the HCP does not account for loss of habitat due to fire and windthrow, suggested better analyses be performed to take into account fire and windthrow, that deferrals or other compensation should be included in the HCP as a margin of safety to protect against fire and/or windthrow impacts, and that the riparian buffers are susceptible to windthrow. One commentor noted that stand replacing fires are less likely using uneven-age stand management since large trees tend to retain moisture and often can withstand low intensity fires. The Sierra Club-Cascade Checkerboard Project noted that roads may cause ignition and that evaluation of fire risk is more than just the amount of fuel-loading. One local organization noted that fire increases diversity.

Services' Response:
In response to concerns about the lack of modeling to "simulate" catastrophic forest disturbance, the Applicant and the Services consulted silviculturists and fire ecology experts. The response was that modeling would not be productive, because effects to wildlife would differ dramatically depending on when and where disturbances were modeled to "occur." For instance, a fire in Forest Service Matrix areas would have a different impact on owl habitat than a large-scale fire in the Forest Service Late-Successional Reserve. Fire history data is of little value in this instance due to changes in vegetation composition in the Planning Area. Although some fire is likely in the next 50 to 100 years, it is impossible to predict the frequency, intensity, or extent. More importantly, large-scale natural disturbance like fire is considered either an "Extraordinary" or "Unforeseen" Circumstance (depending on magnitude) and triggers corrective action as specified in the Implementation Agreement (HCP Appendix 10). The issue regarding stand replacing fires is not even-aged vs. uneven-aged stands but rather density management which increases small tree mortality and fuel loading. The Applicant plans to use thinning to increase the vigor and resistance of younger forest stands to forest health agents, which may influence the level of fuel-loading (see HCP Section 3.5.4). The areas most prone to fire will be the subject of a cooperative landscape adaptive management area. It is hoped that more will be learned on how to manage and begin effecting management which will allow maintenance of owl habitat and still control the risk of catastrophic fires. The Services acknowledge that fire risk includes many other factors specific to each site and that fuels accumulation is one factor that can be affected by management. Fuel loading analysis between alternatives with all other factors being equal is a good means of assessing relative differences. The Planning Area is not at any particularly high risk of windthrow such as occurs during intense storm events on the Olympic Peninsula.

B. Special Habitats

Comment Summary:
The Washington Native Plant Society commented that logging in roadless areas, late-successional, and old-growth stands would endanger plants dependent on the special environments these areas provide.

Services' Response:
One of the objectives of the Applicant's New Forestry experiments is to minimize disturbance to a stand while extracting some highly valuable merchantable timber (see HCP Appendix 7). The treatments used to achieve these objectives were used to develop the "template" for Managed Old-Growth (HCP Section 2.3) and Riparian Habitat Areas (HCP Section 3.3.3.1). Use of these prescriptions in the HCP would address concerns for understory plant communities.

1. Old-Growth Habitat

Comment Summary:
The Yakama Indian Nation, Defenders of Wildlife, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, Wilderness Society, Washington Environmental Council, Washington Native Plant Society, six local organizations, and 68 individuals (five comments written on preprinted cards) commented on other issues regarding old-growth. The Defenders of Wildlife asked that an objective scientific analysis of the sufficiency of retained old-growth in the HCP be performed. The majority of comments suggested that the HCP protects an inadequate amount of old-growth and that additional amounts should be retained. Other comments noted that old-growth needs protection in order to protect associated rare and sensitive plants, to sustain spotted owl populations, or support other old-growth dependent species. Commentors suggested that old-growth forests not be harvested until replacement forest stands contain old-growth characteristics or until land exchanges with the Forest Service are completed. Other comments included that the HCP would result in destruction of irreplaceable ancient forests, retention of less than 1.0 percent old-growth, retention of less than 10 percent of Plum Creek's land in old-growth forest, loss of 40,000 acres of old-growth, retention of old-growth only on Forest Service land, or replacement of old-growth with dispersal forest. Others noted that old-growth is a proven safeguard for the health of endangered and threatened species, roadless areas are old-growth, there is no justification for the liquidation of most of the old-growth on Plum Creek's lands, old-growth was not modeled appropriately, and that existing old-growth stands are needed for the recruitment of the dependent species into the replacement stands.

Services' Response:
Review of comments on this topic suggests that there is confusion and overstatement regarding the amount of "old-growth" currently in the Planning Area on all ownerships. A major issue in the debate over old-growth preservation in the past has centered on what type of forests classify as "old-growth." The Applicant defined old-growth using the FEMAT definition (stemming from PNW Research Note 447 and other published sources), as discussed in HCP Section 2.3. Analysis of timber inventory data from the Forest Service, the Applicant, and other landowners (HCP Sections 2.6.2 and 2.6.3) indicated that forest stands meeting these accepted definitions of diameter and age (200 years) currently occupy relative little of the HCP landscape (approximately 1.0 percent of the Applicant's land in the Planning Area and 6.0 percent of the total Planning Area, see HCP Table 30). Trends in old-growth forests vary little during the Permit period, from 1.4 percent to 1.6 percent on the Applicant's land and 6.0 percent to 9.0 percent on the entire Planning Area (HCP Table 30). Reviewers may be assuming that mature and managed old-growth may have all the characteristics of old-growth, which is erroneous, because mature forest stands have substantially smaller quadratic mean diameters than old-growth (HCP Section 2.3). Consequently, comments that as much as 40,000 acres of old-growth on the Applicant's lands would be "lost" due to the HCP are not factual.

The Applicant's analysis revealed that increasing the amount of spotted owl habitat (including old-growth) necessary to maintain or increase existing population numbers in the Planning Area, carried an unacceptable economic impact, as well as negative tradeoffs to other wildlife species. The primary emphasis of the HCP was to reduce the impact of short-term harvest of spotted owl NRF habitat (with harvest deferrals and corridors) while maintaining an economically acceptable level of NRF habitat over the long-term with more dispersal habitat to reduce the potential for fragmentation and isolation of the owls using future landscapes.

Land exchanges have been and would continue to be discussed in conjunction with the Planning Area. However, the HCP is designed to be implemented immediately, with changes in ownership adjustments during the Permit period accounted for as described in HCP Section 5.3.4. The HCP provides immediate conservation benefits and identifies retention in key areas necessary for biological support at the landscape level, as well as augmenting the substantial amount of mature and old-growth identified for retention under the Northwest Forest Plan (NWFP).

Concerns for requiring more old-growth for recruitment of "dependent species" into replacement stands was not shared by biologists consulted in the development of the HCP. Discussions with biologists familiar with the area could not identify individual species that were entirely dependent on old-growth forest in the Planning Area; most of the "late-successional species" have been found in mature and managed old-growth as well as old-growth forests. Presence of the species in forest stands other than old-growth is dependent on a variety of factors, including the availability of snags and downed wood, recognized as a Special Habitat and discussed in HCP Section 3.4.4. Monitoring to evaluate actual use of these forest structural classes by birds and small mammals is provided for in the HCP under Sections 5.2.1 and 5.2.3.

2. Unique Forest Types (e.g., Oak Savanna, Aspen Grove)

Comment Summary:

The Sierra Club-Cascade Checkerboard Project urged increased protection of Ponderosa pine forests and the importance of snag and green tree retention. The commentor also noted that the riparian conservation strategy in these areas may not work as well because fewer streams maintain their flows throughout the year in this drier zone.

Services' Response:

The Applicant has added this Special Habitat to the HCP (Section 3.4.6, see FEIS Appendix 4 and Table 30b). The Applicant currently utilizes selective harvesting in Ponderosa pine stands where such techniques are operationally and silviculturally appropriate. The Applicant's continued use of selective harvesting would result in multi-aged stands over the Permit period. Where development of a multi-aged forest is not possible (i.e., site conditions, forest health management), the Applicant would enhance opportunities for biological diversity by leaving trees of various size classes, as well as existing snags and snag recruitment trees. Ephemeral streams will benefit from use of selective harvesting.

3. Other Key Terrestrial Habitats

Comment Summary:

Three individuals commented that the HCP is inadequate due to exclusion of a key wildlife corridor across the upper Yakima Valley, and two individuals commented that the HCP should protect critical corridors and areas (West Fork Teanaway and Kelly Butte specifically mentioned).

Services' Response:

The Applicant has proposed to maintain landscape connectivity between spotted owl high-density cluster areas and between Designated Conservation Areas (DCAs) through the use of spotted owl deferral areas and maintenance of at least FD habitat conditions in RHA's. The regrowth of habitat on Federal lands would improve connectivity in 20 years from the start of the Permit period. The rationale for designating NRF deferrals and FD corridors (HCP Section 3.2.1.1) includes retention of late-successional habitat to facilitate movement of spotted owls and other wildlife species across the I-90 corridor. Data acquired in preparation of the HCP by the Applicant did not indicate that the West Fork Teanaway and Kelly Butte areas had specific

wildlife taxa or special habitats that were not found elsewhere in the Planning Area. Furthermore, the Applicant addresses these habitats in Section 3.4 of the HCP.

a. Dispersal corridor

Comment Summary:
The Sierra Club-Cascade Checkerboard Project, Wilderness Society, two local organizations, and 12 individuals (one comment written on a pre-printed card) commented on the issue of dispersal corridors. Questions and comments included the need for corridors across I-90 to provide north/south movement of species and the protection of other critical corridors for wildlife, recommendations for a reserve and corridor strategy in the HCP, that each forest zone should have dispersal corridors, and that fragmentation impedes dispersal.

Services' Response:
As stated above, the Applicant would maintain landscape connectivity between spotted owl high-density cluster areas and between Designated Conservation Areas (DCAs) through the use of spotted owl deferral areas and maintenance of at least FD habitat conditions in RHA's (all forest zones) and landscape level amounts of FD. The rationale for designating NRF deferrals and FD corridors (HCP Section 3.2.11) included retention of late-successional habitat to facilitate movement of spotted owls and other wildlife species across I-90. The regrowth of habitat on Federal lands would improve connectivity in 20 years from the start of the Permit period.

The Applicant and the Forest Service are sharing data to collectively assess current and future landscape conditions in the linkage corridors identified in the Forest Service's draft EIS for their Snoqualmie Pass Adaptive Management Area Plan (SPAMA). The Services expect that communication and coordination on this issue would continue through the Permit period as discussed in HCP Section 5.4.3.4.

b. Snag concentrations

Comment Summary:
The WDFW urged for more protection of hollow snags. The Yakama Indian Nation and one individual stated that the model assumptions regarding snags on old clearcuts for habitat projections for species dependent on snags is overly optimistic, and questioned why HCP commitments for snag retention is less than Yakima Resource Management Cooperative commitments. The Sierra Club-Cascade Checkerboard Project and Northwest Ecosystem Alliance urged that the HCP should increase the size and number of snags retained outside of RHAs on Plum Creek's lands. One individual commented that dense stands of smaller trees characterizing Dispersal Forest stands lack the large snags needed by spotted owls; one individual supported the retention approach of the HCP and the past efforts of Plum Creek.

Services' Response:
Snag retention strategies were the subject of considerable discussion between the Applicant, the Services, and the WDFW. The definition of dispersal forest, used by the Applicant, was based in part on stands currently meeting definitions for spotted owl habitat. These stands generally have the minimum number of snags and downed logs to provide for prey habitat and roosting opportunities for spotted owls. As specified in HCP Section 2.4, forest stands in RHAs would be managed at a higher relative density, because periodic thinning is not proposed in these areas. Consequently, tree mortality and snag densities

would be more prevalent in these areas, as would a larger diversity of trees in terms of size, age, and species. Voluntary snag retention levels identified in the YRMC are still being experimentally applied by the Applicant to evaluate costs and feasibility with harvest systems such as cable yarding; results to date are too preliminary for the Applicant to implement these voluntary guidelines on an long-term landscape level. Snags were assumed, by the Applicant, to be minimal in old clearcuts. Forest modeling for the HCP did not give "credit" to even-aged harvest units providing secondary habitat for snag dependent species until 10 to 20 years into the Permit period to reflect added retention now occurring under Forest Practices Rules and Regulations, and the Applicant anticipates that snag retention would increase in the future. The Applicant provides a discussion of this modeling adjustment in HCP Section 3.2.2. Special consideration for hollow snags has been added to the HCP as a result of these comments. Hollow snags would now be a priority for snag retention, where they are available and consistent with State worker-safety rules.

c. Talus slopes

Comment Summary:
The WDFW and Northwest Indian Fisheries Commission stated it was not clear how many trees would be retained adjacent to talus slopes and what level of harvest is allowed in the buffer. The Sierra Club-Casacade Chapter questioned how talus areas less than 1.0 acre would be treated, how talus fields would be mapped, if talus areas above 3,400 foot elevation would be excluded from the habitat projections, and if portions of larger talus slopes with sufficient shade and moss would be included in projections.

Services' Response:
Management of talus slopes as a Special Habitat is described in HCP Section 3.4.2. In the Planning Area, talus slopes vary from very small inclusions to hundreds of acres. Forest conditions adjacent to talus slopes vary from dense forests to highly scattered and open stands. Consequently, more specific guidelines regarding the number of trees to be retained could not be ascertained at this time. Talus areas smaller than 1.0 acre are likely to be addressed by the Applicant at the project level when operations are more refined. Talus areas within forest areas can be identified by revising the Applicant's forest inventory methodology. Talus areas above 3,400-foot elevation were included in the HCP to protect potential habitat which might support Larch Mountain salamanders. Additional mitigation has been added to the HCP by the Applicant focusing tree retention around talus slopes to maintain shading and provide a source of coarse woody debris.

d. Caves

Comment Summary:
The WDFW recommended larger minimum buffers to reduce potential impacts. The Northwest Indian Fisheries Commission requested more details on the buffer, and the Sierra Club-Cascade Checkerboard Project asked what the basis is for the 25-foot buffer distance and why buffers are not proposed for nurseries or other roosts.

Services' Response:
Caves have been further defined and the protection zone around caves has been expanded from 25-feet to 100-feet (HCP Section 3.4.2) in response to these comments. This buffer would be designed around site-specific conditions, but would not be less than 100-feet from the entrance of the cave. The 100-foot buffer

would be managed, if adequate trees and size classes are available, to approximate FD habitat (see HCP Section 2.4; Spotted Owl Habitat Types) similar to that prescribed for the 100-foot RHAs (see HCP Section 3.3.3; Riparian Habitat Protection).

Additional steps proposed by the Applicant to protect known hibernation or denning caves includes prohibition of human disturbance near the entrance of caves, and elimination of the spraying of herbicides or fertilizers within 100-feet of caves. The managed buffer of this size was developed in conjunction with the Services and is considered adequate to maintain stable temperature and relative humidity in adjacent caves and to address the biological needs for most, if not all, cave-dependent species.

Information on additional nurseries and roosts for bats beyond caves was inadequate for the Applicant to offer site specific guidelines. However, snag retention guidelines have been strengthened and revised by the Applicant to include hollow snags, which are potential bat roosting locations.

4. Mineral Springs

See Band-tailed pigeon.

5. Wetlands, Forested Wetlands, Seeps

Comment Summary:

The WDFW, Northwest Indian Fisheries Commission, Puyallup Tribe of Indians, Sierra Club-Cascade Checkerboard Project, and two individuals (one comment written on pre-printed card) commented on issues regarding wetlands. Comments included that additional measures are needed to ensure the protection of habitat for wetland-associated species and should exceed minimum State guidelines and regulations. One commentor noted that we are running out of wetlands and another noted that no evidence is presented in the HCP that shows impacts to forested wetlands would not adversely affect species associated with them. Another commentor noted that the proposed watershed analysis does not consider wetlands, seeps, bogs, or springs, and therefore, provides inadequate data to evaluate the effects of the Plan on aquatic ecosystems.

Service's Response:

Based on discussions with the Services and public comments, additional measures protecting wetlands have been added to the HCP by the Applicant (see FEIS, Appendix 4, Section 3.4.1). In addition, a new section has been included in the HCP regarding protection of seeps and springs (FEIS, Appendix 4, Section 3.4.5). Bogs are protected under State Forest Practices Rules. Some of the measures included in the HCP to protect these aquatic habitats exceed State Forest Practices Rules (nonforested wetlands and bogs greater than 5 acres would receive a 100-foot minimum and 200-foot average buffer width). Watershed analysis procedures established by Washington State are being used by the Applicant to focus on fish and water quality issues, but should provide benefits for other aquatic dependent species such as amphibians. Many wetlands, especially in the eastern portion of the Planning Area, are associated with riparian zones and therefore are expected to be protected by RHAs. See also Responses to Aquatic Habitats and Amphibians.

6. Riparian Ecosystems

a. Buffer width

Comment Summary:

The Northwest Indian Fisheries Commission, Puyallup Tribe of Indians, Tulalip Tribes, Yakima Indian Nation, Defenders of Wildlife, Northwest Ecosystem Alliance, Wilderness Society, Sierra Club-Cascade

Checkerboard Project, Rivers Council of Washington, eight local organizations, 75 individuals, and 424 preprinted cards commented on the issue of buffer widths. Questions and comments indicated that the HCP buffers on fish and nonfish-bearing streams were inadequate and the no-harvest buffer width should be increased, some commentors recommended that HCP buffers match those in FEMAT for Forest Service lands, and some comments urged that buffers be established on all stream types and wetlands.

Services' Response:
As stated in Section 3.3.3.1, the RHAs were designed by the Applicant to provide amounts of large woody debris, shading, nutrient input, and bank stability that are sufficient to protect and maintain aquatic habitat for fish. The RHAs apply to all fish-bearing streams and to perennial, nonfish-bearing streams with the greatest potential to influence habitat in fish-bearing waters. The Services believe that the RHAs provide protection similar to that provided by FEMAT buffers for Type 1-3 and most Type 4 streams, and that by allowing minor amounts of harvest in riparian areas the Applicant can actually help to restore many areas previously impacted by natural and harvest-related disturbance. The Services further believe that the RHAs meet the riparian functions necessary for healthy fish habitat, and the Applicant's riparian strategy does an excellent job of supplementing the more conservative riparian reserves on Federal land. It is also important to recognize that the riparian widths described in the HCP are not only interim, but also minimum widths measured as horizontal distance instead of slope distance as proposed in FEMAT. In other words, RHA buffers may increase in width as a result of watershed analysis, but they would never decrease. Buffers would be provided on many Type 5 streams primarily to prevent erosion and for many wetlands, but the buffers would be tailored to site-specific landscape considerations.

b. Buffer treatment

Comment Summary:
The Northwest Indian Fisheries Commission, Puyallup Tribe of Indians, Tulalip Tribes, Yakima Indian Nation, Defenders of Wildlife, Sierra Club-Cascade Checkerboard Project, Sierra Club-California, The Wilderness Society, Northwest Ecosystem Alliance, a professor at the College of Forest Resources (University of Washington), five local organizations, 76 individuals, and 424 preprinted cards commented on the issue of stream buffer treatment. Questions and comments included support for the riparian approach of the HCP, urged additional protection on tributaries, streams, and wetlands by adding protection or increasing the no-harvest area, urged no logging along streams, recommended that buffer treatment be similar to Federal plans, and noted the lack of performance standards associated with establishing buffers.

Services' Response:
Performance standards based on relative density and quadratic mean diameter are included for RHAs (Section 3.3.3.1). Watershed analysis prescriptions may also place performance standards on riparian areas (e.g., maintain a certain density of trees over a certain diameter). The Applicant has also added additional 100-foot RHAs on Type 4 streams in watersheds with anadromous fish, bull trout, or 303(d) concerns east of the Cascade crest and prohibited ground-based equipment within 30 feet of all streams with RHAs. Regardless of watershed analysis prescriptions or HCP guidelines for volume removal, certain minimum conditions must always remain within the managed riparian buffer. This is a critical component of the riparian strategy. If 50 percent of the merchantable volume cannot be removed and still maintain dispersal habitat conditions, then a lower-level of harvest will be required. Thus, in many cases, 50 percent removals will not occur. Two conditions will always be met, Relative Density and Quadratic Mean Diameter. These are described in Section 2.4 of the HCP (Spotted Owl Habitat Types).

On the west side, a relative density of 48 and a quadratic mean diameter of 10 inches will be maintained, which should equate to a minimum canopy closure of 70 percent and about 175-280 trees per acre. On the east side, a relative density of 33 and a quadratic mean diameter of 9 inches will be maintained, which should equate to a canopy closure of about 55-60 percent and about 225 trees per acre. It is expected that stands of this type would have basal areas of 95-112 and 105-126 trees per acre on the west and east sides of the Cascade crest, respectively.

Goals discussed in the document for large woody debris (LWD) are relative to what could be expected if the riparian areas remained unmanaged. This is not in relation to what could be expected in an old-growth stand because, as many reviewers indicated, the current situation includes many riparian areas which have been previously harvested and still remain in younger seral stages. In fact, the flexibility to manage many of these stands through thinnings provides an opportunity to achieve larger diameter trees more quickly than in an unmanaged stand. The Services believe it is desirable to hasten the recruitment of LWD in many of these areas. In addition, the provision for only one entry per 50 years provides abundant opportunities for senescence and mortality leading to an adequate supply of large woody debris (in aquatic systems), course woody debris (on the ground), and snags and defective trees used by wildlife. These factors should lead to conditions which meet or exceed the Services' goals for aquatic, riparian, and terrestrial species and their habitats in these critical areas. (See also Stream Buffer Widths response).

c. Ephemeral/Intermittent streams

Comment Summary:

The WDFW, Yakama Indian Nation, Northwest Indian Fisheries Commission, Puyallup Tribe of Indians, Tulalip Tribes, Northwest Ecosystem Alliance, River Council of Washington, Sierra Club-Cascade Checkerboard Project, Sierra Club-California, three local organizations, 43 individual letters, and 424 preprinted cards commented on the issue of ephemeral and intermittent streams. Questions and comments included that the HCP would provide essentially no protection or inadequate protection of this landscape feature and additional buffers are required; suggestions that 100-foot, no-harvest or Forest Service width buffers be established; all trees with stream bank or bed roots should be left along these streams with a "windfirm" buffer; emphasis should be placed on these important headwater streams; and that watershed analysis does not address these stream types. The Sierra Club-Cascade Checkerboard Project also noted that habitat for riparian species were only evaluated in RHAs and wetlands; no ephemeral/intermittent streams were used in the analysis.

Services' Response:

Ephemeral/intermittent streams are indirectly addressed through Forest Practices leave tree requirements and watershed analysis. The Applicant would usually clump leave trees adjacent to intermittent streams. Watershed analysis would identify streams with the potential for erosion. These streams would typically have riparian buffers (ranging from 30 to 100+ feet) and logging and road construction are prohibited in these buffers. The buffers for streams with erosion potential should help the Applicant to maintain bank stability and ensure large woody debris input for sediment storage as well. However, there would be intermittent streams that receive no riparian protection (e.g., in areas not prone to erosion). The Services believe these unprotected streams would not substantially degrade downstream water quality. This would be evaluated through monitoring. Until watershed analysis is completed in the Planning Area, riparian habitat protected by watershed analysis prescriptions will be difficult to predict and model. Inclusion of habitat along ephemeral streams as suitable habitat for some Lifeforms would only increase the amount of suitable habitat.

d. Inner Gorges

Comment Summary:
The Puyallup Tribe of Indians and Tulalip Tribes expressed concern for nonfish-bearing streams and the protection of inner gorges that are susceptible to landslides before watershed analysis identifies them and the Northwest Ecosystem Alliance commented that protection of landslide prone areas in inner gorges in the HCP differs from that in the FEMAT report and is inadequate.

Services' Response:
Existing Forest Practices Rules and Regulations include limitations for logging on steep slide-prone slopes (HCP Appendix 5). In addition, watershed analysis would be used by the Applicant to identify these steep sensitive areas. Most prescriptions for these areas (e.g., inner gorges) include riparian buffers that generally prohibit harvesting and road construction. In the interim, State regulations preclude harvest and road construction on slopes at risk of failure.

e. Watershed analysis

Comment Summary:
The Puyallup Tribe of Indians requested that additional interim measures be implemented until watershed analysis is performed, such as deferrals in inner gorges and verification of fish use; the Tulalip Tribes commented that on page 264 of the HCP, watershed analysis would be used to prevent landslides caused by forest activity, but in the interim, no protection measures are provided; the Yakama Indian Nation commented that watershed analysis is weak because it lacks riparian standards; and the Muckleshoot Indian Tribe commented that the DEIS fails to consider environmental benefits attained through watershed analysis. The Muckleshoot Indian Tribe also commented that the HCP does not ensure the ability of Federal or tribal involvement in the watershed analysis process. The WDFW, Sierra Club-Cascade Checkerboard Project, one local organization, and four individuals commented that watershed analysis is designed specifically for protection of fish habitat and is inadequate because it would not necessarily provide for the needs of wildlife. The Sierra Club-Cascade Checkerboard Project also commented that the State watershed analysis process has several shortcomings (e.g., no inclusion of wetlands, seeps, bogs, springs, wildlife concerns, inadequate cumulative effects analysis) and is not a substitute for habitat planning and protection. The Sierra Club also stated that past watershed analyses have not been sufficient because there has been no wildlife or water quality modules. The Washington Forest Protection Association commented that the HCP was strengthened by incorporation of watershed analysis. One individual felt that watershed analysis should be part of all alternatives. One individual, on a preprinted card, commented that the HCP relies too much on watershed analysis and another individual said that watershed analysis was more desirable than "piece-meal" management.

Services' Response:
Watershed analysis is not used in the HCP by the Applicant to address other resources (e.g., terrestrial wildlife); these are addressed through other mechanisms. Watershed analysis focuses on fish and water quality issues, but should provide benefits for other aquatic dependent species such as amphibians. Wetlands, bogs, and seeps are part of the water-quality module which the Applicant has tested in two watershed analyses completed to-date. The water-quality module would likely be accepted as part of the process in 1996. Riparian standards are provided by RHAs and in combination with watershed analysis

should provide effective protection for aquatic species. The DEIS has been modified (see Table 1 and Sections 4.6. and 4.9) to clarify that the Applicant would **not** initiate watershed analysis for any of the alternatives except the Preferred Alternative. This change does not significantly affect the conclusions for environmental impacts because few watershed analyses would likely be completed in the Planning Area in a timely manner without initiation by the Applicant. HCP Section 3.3.2, Watershed Analysis (see FEIS Appendix 4), has been clarified with additional text to further explain the Washington State watershed analysis process, including the ability of Federal and State agencies and local Tribes to participate. A number of interim measures are in place to protect areas prior to completion of watershed analysis. These measures include verification of stream typing and avoiding harvest in steep slide-prone areas as per State Forest Practices Rules and Regulations. Some of the measures included in the HCP to protect aquatic habitats exceed State Forest Practices Rules (e.g., nonforested wetlands and bogs greater than 5 acres would receive a 100-foot minimum and 200-foot average buffer width). Watershed analysis procedures established by Washington State are being used by the Applicant to focus on fish and water quality issues, but should provide benefits for other aquatic dependent species such as amphibians. Many wetlands, especially in the eastern portion of the Planning Area, are associated with riparian zones and therefore are expected to be protected by RHAs. See also Responses to Aquatic Habitats and Amphibians. Implementation of the HCP does not exempt the Applicant from following State Forest Practice Rules and Regulations, but simply adds another layer of protection.

f. 303(d) streams

Comment Summary:
The EPA recommended that stream temperature monitoring be expanded in duration during the Permit period; the Yakima Indian Nation commented that no description is provided in the HCP of the deferral set back from these stream portions; the Northwest Indian Fisheries Commission asked what is the condition of the riparian areas surrounding the currently listed 303(d) segments and if Plum Creek is planning restoration of these areas, and one individual commented that temperature impacted stream segments can be barriers to salmonid migration.

Services' Response:
Stream temperature monitoring is an integral part of watershed analysis and therefore would be applied throughout the Permit period. Section 3.3.4 indicates that deferrals would occur within the RHA width of 200-feet and in wetland management zones. Since all 303(d) listed streams are within federal Late Successional Reserves or Adaptive Management Areas, Type 4 streams within these watersheds would receive 100-foot RHAs. The condition of the RHAs varies from stream to stream and restoration in harvested areas is likely limited to ensuring that revegetation takes place. Stream temperatures measured in these 303(d) listed waters are not sufficiently high at present to prevent salmonid migration.

g. Stream shading

Comment Summary:
The Yakama Indian Nation commented that RHA widths, management prescriptions, and yarding corridors would not guarantee tree retention for effective stream shading, and the Puyallup Tribe of Indians asked that monitoring of RHA prescriptions on stream shading be incorporated into the HCP. One individual commented on the importance of stream shading to salmonid use of streams; and two other individuals commented that riparian protection measures (Type 4 and 5 streams mentioned specifically) are inadequate to provide shade for fish or amphibians in these areas.

Services' Response:
The Services believe the combination of RHAs, watershed analysis, and current Forest Practice Rules and Regulations would ensure that sufficient riparian vegetation is retained to meet riparian shade function for fish. The Applicant has also incorporated a specific monitoring objective for testing the effectiveness of various riparian retention strategies in maintaining cool stream temperatures (HCP Sections 3.3.5 and 5.16). Type 4 streams would have substantial shade retention as a result of RHAs (HCP Section 3.3.3.2). Although Type 4 and 5 streams by definition do not contain fish, the Services anticipate that amphibians would be protected by RHAs and other leave-tree requirements under State Forest Practice Rules and Regulations and prescriptions resulting from watershed analysis.

h. Bank stability

Comment Summary:
The Northwest Indian Fisheries Commission commented that the HCP strategy for nonfish-bearing, perennial streams does not substantially improve on State Forest Practices Rules and Regulations for maintaining bank stability, and the Yakama Indian Nation commented that removal of merchantable timber adjacent to stream banks would cause the loss of bank stability.

Services' Response:
The Services believe that the RHAs of 100-feet for nonfish-bearing, perennial streams is a substantial improvement over no protection as provided under State Forest Practice Rules and Regulations. The Applicant has agreed that all trees along a streambank that are considered important for maintaining bank stability would be retained in RHAs (Section 3.3.3.1).

i. Detritus (litter)

Comment Summary:
The Yakama Indian Nation commented that removal of merchantable timber adjacent to stream banks would cause the loss of nutrient input, and one individual commented that intermittent streams provide conditions for detritus production and is important for the salmon food web.

Services' Response:
The Services believe that the RHAs proposed by the Applicant will be adequate for maintaining nutrient input into the stream network. Nearly 100 percent of nutrient input occurs within half a tree height distance of a stream (HCP Section 3.3.3.2 and Figure 35) and the Applicant designed the RHAs to provide one tree height protection on fish-bearing streams and one-half to a full tree height of protection on most perennial, Type 4 streams.

j. Microclimate

Comment Summary:
The Northwest Indian Fisheries Commission commented that terrestrial amphibians are dependent on the moist microclimate of riparian areas and that additional protection measures are needed; and the Yakama Indian Nation commented that removal of merchantable timber adjacent to stream banks would alter the stand's ability to moderate microclimatic conditions. One individual commented that riparian measures (Type 4 and 5 streams mentioned specifically) are inadequate to provide the microclimate needed by

amphibians in these areas.

Services' Response:
Retention of trees in RHAs would provide the shading and buffering necessary to minimize alteration to microclimate. Within one tree height distance, soil moisture, solar radiation, soil temperature, and to a large extent air temperature are maintained at or near interior forest conditions (FEMAT 1993). Amphibians in particular use the cover from large woody debris on the ground to maintain microclimate needs. The Services do not expect the removal of timber in RHAs to substantively alter the habitat conditions required for amphibians. The option for clumped RLTAs were developed specifically for amphibians and should provide refugia for microclimate-dependent species.

7. Aquatic Habitats (standing water bodies)

Comment Summary:
The Puyallup Tribe of Indians requested that the HCP require practices which exceed State minimum standards for wildlife habitat protection in wetlands, and one individual asked if, because primary habitat for Lifeforms 2 and 3 increase during the Permit period, harvesting is going to increase water and wetland areas.

Services' Response:
The Applicant has added protection around wetland areas in the HCP (Section 3.4.1.2). These additional measures include: (1) only one entry in forested wetlands or wetland management zones within 50 years; (2) leave trees in the buffers that are representative of the stand; and (3) ground-based equipment exclusion from non-forested wetlands and within 25 feet of non-forested wetlands or forested wetlands with open water. Primary habitat increases for Lifeforms 2 and 3 because of riparian stand growth into older structural classes. The older structural classes of vegetation along streams are preferred by these two Lifeforms. The amount of "usable" habitat increases as a result of increases in habitat quality.

a. Large woody debris

Comment Summary:
The Yakama Indian Nation and Puyallup Tribe of Indians commented that RHA widths, management prescriptions, and yarding corridors would not guarantee tree retention for LWD recruitment; the Tulalip Tribes and Northwest Indian Fisheries Commission asked that the HCP require the inclusion of standards for mean diameters of LWD and for monitoring of the effectiveness of RHA prescriptions for LWD recruitment; the Muckleshoot Indian Tribe recommended that 100-foot, no-harvest buffers be established on Type 1, 2, and 3 streams for LWD recruitment; and one individual commented that protection of Type 4 and 5 streams is inadequate to provide large wood for amphibians.

Services' Response:
One of the primary objectives of the RHA widths and management prescriptions proposed by the Applicant is to provide full riparian function for LWD input (Section 3.3.3.1). The amount of timber volume potentially taken by the Applicant from an RHA including yarding corridors, would not significantly reduce potential LWD recruitment because in most cases far less than 50 percent of the volume would be removed and the feathering treatment would remove trees that have the least opportunity to fall into the stream (Section 3.3.3.1). The relative density and quadratic mean diameter criteria are standards similar

to mean diameter and result in approximately 175-280 trees per acre with minimum quadratic mean diameters of 10 inches west of the Cascade crest and 225 trees per acre with minimum quadratic mean diameters of 9 inches east of the Cascade crest. Effectiveness of RHAs proposed by the Applicant would be evaluated in watershed analysis and subsequent monitoring and/or review by the Services (Sections 3.3.5 and 5.1.6). Allowing some harvest in RHAs would actually accelerate restoration by increasing the growth of riparian trees. The Services believe full riparian function for LWD would be met for fish-bearing streams. The Services also believe that the RHAs proposed by the Applicant for perennial, Type 4 streams would provide sufficient large wood for amphibians and other species, as well as functions like sediment storage. The Services believe riparian habitat provided under the HCP will be substantially better than under the No-Action Alternative and therefore the riparian-associated species will benefit.

*b. **Substrate** (sediment)*

Comment Summary:
The EPA suggested that Plum Creek monitor bedform habitat features such as pools and riffles, and annual net bed scour and fill to provide information on changes in channel stability and habitat complexity. The WDFW, Yakama Indian Nation, Puyallup Tribe of Indians, and four individuals suggested that Plum Creek reduce road mileage, and increase protection of intermittent streams to lessen the input of silt and sediment into these streams. One individual commented that sediment input into intermittent streams in the upper watersheds in the Planning Area is a chronic problem. Another individual commented that continued clearcut logging in the Planning Area would increase sedimentation into streams.

Services' Response:
The Applicant has committed to monitoring bedform habitat (Sections 3.3.5 and 5.1.6). The Applicant would be taking a number of measures to reduce sedimentation into streams from roads. These measures include bringing old roads up to current roadway standards, minimizing direct delivery of sediment from road surfaces to streams, and abandoning roads, where practicable (Section 3.3.3.1). Erosion from clearcut logging would be evaluated by the Applicant in watershed analysis.

c. Channel migration and morphology

Comment Summary:
The Puyallup Tribe of Indians asked that the HCP require monitoring of the effectiveness of RHA prescriptions for channel stabilizing goals; the Tulalip Tribes commented that there is no consideration of the potential of a stream channel to migrate over time; one individual commented that riparian protection is inadequate and that problems in the headwaters of streams result in changes to channel morphology; and one individual asked that road building be reduced to lessen stream channelization by road corridors.

Services' Response:
The Applicant has committed to monitoring channel stability (Sections 3.3.5 and 5.1.6). The potential for channel migration would be evaluated by the Applicant in watershed analysis and appropriate prescriptions would be provided. The combination of RHAs and watershed analysis would be effective in reducing or preventing management-related erosion, the primary agent in changing channel morphology (Section 3.3.3.1). As discussed in HCP Section 1.2.3, the Applicant rarely builds roads parallel to streams, and the Applicant has worked in a number of circumstances to move or abandon roads adjacent to streams (Section 3.3.3.1).

d. Riffles and pools

Comment Summary:
The Northwest Indian Fisheries Commission commented that not all fish species need the same specific spawning and rearing habitats and therefore treatment in the HCP is contradictory.

Services' Response:
The HCP was not designed by the Applicant to provide spawning and rearing habitat specific to any one species, but rather, to maintain the natural characteristics of streams in the Pacific Northwest. These characteristics include, but are not limited to, adequate large woody debris, natural erosion and sedimentation rates, and cool stream temperatures (Section 3.3).

e. Downstream habitat

Comment Summary:
The Puyallup Tribe of Indians was concerned about effects of increased sediment on downstream fish habitat. One individual commented that the HCP does not address impacts to downstream economies and recreation caused by changes in hydraulic regime as a result of increased harvest on all stream types.

Services' Response:
The Services believe that anticipated changes in the hydraulic regime as a result of harvesting as proposed in the HCP would be minor and not expected to have any impacts on the economy or recreation downstream (see Flooding). The Applicant intends to addresses sedimentation of streams during watershed analysis. The Services believe downstream habitat will be substantially better and impacts will be substantially less than under the No-Action Alternative.

f. Off-channel habitats

Comment Summary:
One individual commented that intermittent stream protection is inadequate due to off-channel areas being important for salmon during high flow periods.

Services' Response:
See Anadromous Fish - Coho.

8. Forested Habitat Components

a. Stand structural stages

Comment Summary:
The WDFW commented that the Stand Initiation stage does not appear to coincide with the definition developed by Oliver and requested verification that structural stages would be monitored, post-harvest, to determine if desired conditions were met. The Sierra Club-Cascade Checkerboard Project commented that the Stand Structural Stages are insufficient for analysis of wildlife habitat and that the modeling does not account for lack of residual trees and snags in past harvest units. One individual requested clarification of the ecological habitat classification system.

Services' Response:
The Ecological Habitat Classification is a coarse-grained hierarchical system that focuses primarily on physical characteristics of the Planning Area (See HCP Section 2.1), such as geologic district and landtype

association. To get to more precise levels of mapping, vegetative characteristics become essential. Forest cover types or forest habitat types are the linkage, since this level is where physical characteristics (e.g., soils, elevation) interact with vegetative characteristics (i.e., dominant tree species, structure class) to create more specific mapping units.

Stand structure stages (or earlier versions) have provided the basis for evaluating habitat diversity at the landscape level in at least two other major forest compendia (Blue Mountains and Western Oregon/Washington). The reason for using structure stages is that they incorporate various stages of forest development, relate to the biological needs of forest wildlife, and can be easily identified and mapped across ownerships. Used as a coarse-grained planning tool at the landscape level and "calibrated" with inventory data and ground verification as discussed in the HCP (Sections 2.3 and 5.1.1), structure stages provide a viable method to assess current conditions and change over time in the Planning Area.

The Stand Initiation stage is identical to that proposed by Oliver et al. (1994), except that the Applicant included additional snag retention as currently required by State Forest Practices Rules and Regulations, provided under the Applicant's Environmental Principles, or proposed in the HCP. Stand Initiation classes were not included as secondary habitat for cavity-nesting species until after 10 years into the Permit period to provide sufficient time for these "new" prescriptions to dominate the landscape (see HCP Section 3.2.2 and Response to Snag Concentrations).

b. Stand structural stage amounts

Comment Summary:
The Northwest Indian Fisheries Commission commented that there should be less emphasis on maintaining early successional habitat in riparian areas since this stage should not be a limiting factor on a tree farm; the Sierra Club-Cascade Checkerboard Project and one individual commented on the substantial loss of late-successional forest; and one individual stated the HCP understates the amount of "good" habitat which currently exists by showing several roadless areas (W.F. Teanaway, Scatter Creek) as already cut over on the 1996 Forest Condition map.

Services' Response:
Contrary to some landscape assessments, the HCP evaluated the amount and juxtaposition of **all** structural stages to meet the FWS criteria for "adequately addressing" species included in the Incidental Take Permit, as well as other species that would be added to the permit if they should become listed under the ESA. The object was to ensure that these habitats were provided by design, not by default. As discussed in HCP Section 3.5.3.6, habitat for Lifeform 6, which includes 9 species that prefer shrubby habitat near water, is projected to decline as riparian management focuses on retention of more complex structural stages. Monitoring of this habitat has been identified and is described in HCP Section 5.4.3.3. While the Services are not particularly concerned regarding the quantity of early seral habitats in this area, its quality and location are important to benefit associated species. However, the Services agree with the commentors and have placed their attention primarily on mature forest with structure and healthy riparian systems.

Based on 1994 data and "aged" two years, the 1996 stand structure stage map (HCP Figure 46) included some proposed harvest units which were anticipated to occur prior to implementation of the HCP (1995-1996). This was done to make the first few years of the HCP "track" with planned harvests as closely as possible. Some of these units were subsequently not harvested to provide additional opportunities for land

exchange. Scatter Creek is one of those units. Consequently, the total acres of Mature, Managed Old-Growth, or Old-Growth may be underestimated slightly.

c. Relative density (stocking)

Comment Summary:
The Northwest Indian Fisheries Commission commented that the use of relative density (RD) to describe stand conditions does not accurately result in a description of the stands' habitat values and the Washington Environmental Council commented that the use of RD is not a biologic measure for species richness and diversity.

Services' Response:
Relative density is a measure of crown competition and was used as a "surrogate" for canopy closure. The use of relative density had distinct advantages over canopy closure in that it is more rigorously measured, is commonly used in timber inventories across ownerships, and can be incorporated into forest growth and yield models. Relative density, like canopy closure, is not in and of itself a "biologic measure of species richness and diversity". There are no stand level parameters to our knowledge that singularly can predict or describe species richness and diversity.

d. Canopy structure and closure

Comment Summary:
The WDFW commented that the old-growth characteristic of two or more distinct layers to the canopy can also occur in mature forests in the eastern Cascades. One individual commented that selective harvesting and uneven-age management should be part of the chosen alternative due to the increase in habitat that vertical stand complexity provides, and one individual commented that the HCP would result in small parcels of habitat that won't be viable for organisms that depend on diverse canopy structure.

Services' Response:
There are many areas in the HCP where selective harvesting by the Applicant would be used to achieve biological objectives of vertical stand diversity, including spotted owl FD habitat (Section 2.4), Riparian Habitat Areas (Section 3.3.3.1), Wetlands Habitat (Section 3.4.1.) and Cave protection (Section 3.4.3). Because these selective harvesting prescriptions would be employed by the Applicant to address many concerns throughout the Planning Area, concerns for "small parcel" isolation would be minimized. The multi-canopy characteristics of old-growth have been retained in the "New Forestry" experiments the Applicant has completed thus far, because only high value trees have been extracted, leaving residual trees in multiple age and size classes.

e. Tree size (stand and tree diameter and quadratic mean diameter, QMD)

Comment Summary:
The Northwest Indian Fisheries Commission commented that QMD is not the same as average DBH and these two terms are used interchangeably in the HCP causing confusion.

Services' Response:
Confusion was not intentional, but occurs because average DBH is obtained directly in the field and QMD must be calculated from timber inventory and plot data. For the Planning Area, QMD generally is 1.5 inches greater than the average diameter of trees in the stand (for example, 13 inches QMD might equate to about 11.5 inches DBH depending on stand characteristics). The 1.5 inches rule of thumb applies within

a range of stand types. This is because QMD is defined as the diameter of the tree of average basal area, and thus is biased by the larger trees in the stand. This bias was judged by the Services to be acceptable, since the larger trees have more value to wildlife. Stands with broader ranges of diameters will have larger discrepancies between QMD and DBH.

f. Species composition

Comment Summary:
The WDFW asked for clarification of the statement that Douglas-fir is generally replaced in old-growth forests, and one individual commented that logging in roadless areas would impact diverse conifer species composition in these areas.

Services' Response:
Advances in forestry during the last decade include the movement away from "monoculture" forestry to multi-species management. At present, it is common practice to either rely on natural reforestation which favors a mix of native species or plant harvest units with seedlings from a diverse array of species such as Douglas-fir, spruce, and larch. The species chosen are generally those adapted to the site (e.g., elevation, precipitation zone). Douglas-fir is not generally replaced in selectively harvested old-growth forests, with most of the regeneration weighted to hemlock, cedar, and other shade-tolerant species. However, in recent New Forestry experiments, small areas opened by yarding corridors or removal of trees have been "recolonized" by Douglas-fir.

g. Coarse woody debris/downed logs

Comment Summary:
The Yakama Indian Nation, Puyallup Tribe of Indians, Tulalip Tribes, Muckleshoot Indian Tribe, and Northwest Indian Fisheries Commission urged the requirement of upland downed log standards/guidelines in the HCP. The Sierra Club-Cascade Checkerboard Project and the Northwest Ecosystem Alliance urged the retention of high volumes of downed wood well-distributed across Plum Creek's lands to provide habitat connectivity; and one individual commented that downed logs provide animal breeding and hiding cover and HCP guidelines should include retention of downed woody material. Another individual commented that high density stands of Dispersal Forest lack the down wood debris needed by owls.

Services' Response:
Coarse woody debris and downed logs are generally present in areas used by spotted owls. However, "threshold" amounts considered as minimal levels are not known. Contrary to one commentors opinion, the high tree density necessary to meet spotted owl habitat standards would virtually ensure that dead and downed wood would be present in the stand given time. In addition, increased attention given to snag retention (HCP Section 3.4.4) helps ensure a source of large diameter dead trees for downed wood. Under the Proposed Plan, it is expected that requirements of State regulations will be met or exceeded. Various partial-harvest treatments should result in abundant course woody debris. The Applicant will add measurement of course woody debris to its forest inventory.

9. Landscape Components

Comment Summary:
The Sierra Club-Cascade Checkerboard Project, Washington Native Plant Society, Washington Forest Protection Association, and two individuals commented on general landscape issues. Comments included

that landscape planning in the HCP is inadequate due to certain lands being excluded, acknowledged the difficulty of managing for the conservation of species in a checkerboard ownership landscape, acknowledged the HCP is consistent with Washington Forest Protection Association policies on landscape planning, noted that urbanization is increasing in the I-90 corridor and piecemeal solutions would not arrest the problems this urbanization poses, and asked why the Forest Service does not assess the landscape habitat distribution with respect to owls and late-successional species and apply the results to the HCP, SPAMA, and proposed land exchange. One individual on a preprinted card suggested that watershed management, not piecemeal management, be implemented.

Services' Response:
Landscape boundaries selected for the HCP are determined by the Applicant (see response to "Location and Boundaries") and includes areas that are currently known to play a significant role in the conservation of species of concern or would play that role in the future. Concurrent plan development by the Applicant and the Forest Service is an unprecedented opportunity to assess landscape conditions and establish priorities for a majority of the lands in the Planning Area. Assumptions were made for other landowners in the checkerboard ownership pattern (HCP Section 2.6.5). The Forest Service could not assess the landscape conditions because it lacked the timber inventory and habitat databases owned by private landowners (e.g., the Applicant), which are necessary to make accurate assessments.

a. Patch size

Comment Summary:
The Washington Environmental Council, Washington Native Plant Society, one local organization, and seven individuals (one comment on a preprinted card) commented on the patch size of habitats. Issues raised were that fragmentation was not addressed in the HCP, roads cause fragmentation, planned logging reduces the effective patch size of interior old-growth ecosystems and would result in too many edges on remaining patches that would not be viable for organisms, the need for additional multiple-scale planning using spatial analysis of the landscape, land swaps to reduce fragmentation should be a high priority, and clearcuts fragment the landscape and impede dispersal of plants and animals.

Services' Response:
Interior forest patches are provided for in the Planning Area on a smaller landscape scale by the Federal LSR lands (checkerboard 1.0 square mile sections and several section blocks) and on a larger landscape scale adjacent to the Planning Area by the Wilderness Areas and Mt. Rainier National Park. Future exchanges of land between the Applicant and the Forest Service may help facilitate the increase in blocks of Federal LSR lands having interior forest conditions within the Planning Area. Implementation of the HCP would not deter land exchanges; on the contrary, implementation of the HCP should facilitate future exchanges due to the regulatory certainty provided by the HCP, which would allow the Applicant the flexibility to plan operations in areas other than those desired for Federal acquistion. The Services believe that an acceptable balance has been reached between the provision of interior habitat conditions and timber production, given the distribution of landownership in the Planning Area.

b. Connectivity

Comment Summary:
The Yakama Indian Nation, Defenders of Wildlife, Central Cascades Alliance, Wilderness Society, Sierra

Club-Cascade Checkerboard Project, and ten individuals (three comments on preprinted cards) commented on issues related to connectivity. Questions or comments included the need to analyze the inter-connectedness of the HCP to recovery plans, Federal plans, and species management plans for surrounding areas, inadequacy of the Plan in providing landscape connectivity or spatial analysis of the landscape for species other than the spotted owl, the need for consideration of the Cle Elum River property in connecting Federal Designated Conservation Areas for spotted owls, the importance of connecting old-growth habitat, and that connectivity at the site, watershed, and regional level is poorly defined in the HCP. One individual sited two consequences of fragmentation: 1) the lack of recolonization; and 2) inbreeding depression.

Services' Response:
With the exception of FEMAT, most of the other planning efforts of substance in the Planning Area have focussed on the spotted owl. The relationship of the HCP to these other efforts is discussed in the HCP (Section 3.5.1.1) for owl habitat trends related to FEMAT and draft Recovery Plan. The Grizzly Bear Recovery Plan was incorporated into the HCP (see Section 2.10.3.4) and proposed critical habitat for the Marbled Murrelet was displayed and discussed (HCP Figure 19) in relation to habitat surveys and inventory. There currently is no recovery plan nor critical habitat proposed for the gray wolf in the Planning Area. As in the recently released draft Snoqualmie Pass Adaptive Management Area Plan, dispersal habitat and NRF habitat for the spotted owl was assumed to provide connectivity for other late successional species in the Planning Area. The Applicant's definition for FD habitat is more rigorous than that used in the Forest Service plan (see response to "Spotted Owl FD habitat"). The Cle Elum River property was not a functional part of Designated Conservation Areas in the draft Spotted Owl Recovery Plan because this property: (1) lacked spotted owls; (2) lacked spotted owl habitat, and (3) would likely never be spotted owl habitat because of the preponderance of Ponderosa pine and small diameter trees. Connectivity at the site, watershed and regional level, was not specified at the coarse-grained HCP planning level because processes discussed and described in the HCP would address this issue during the Permit period. For instance, timber sale layout and harvest deferrals would address connectivity at the site level; watershed analysis and RHA/RCA linkage would occur at the watershed level and cooperative management and research with the Forest Service and the Services would continue at the regional level.

c. Interior forest

Comment Summary:
The Yakama Indian Nation stated that consideration of interior forest habitats is overlooked in the HCP analysis and RHAs are edge effected**.** One local organization commented that the HCP would result in too many edges in relation to the old-growth that would exist on Forest Service land; and one individual questioned the increased edge effect on RHAs and the resulting potential for increased use of these areas by spotted owl predators.

Services' Response:
Vegetative and microsite conditions which affect interior forest habitats are poorly understood and too imprecise to be implemented in a landscape scale conservation plan of this nature. Interior forest patches are provided for in the Planning Area on a smaller landscape scale by the Federal LSR lands (checkerboard 1.0 square mile sections and several section blocks) and on a larger landscape scale adjacent to the Planning Area by the Wilderness Areas and Mt. Rainier National Park. Future exchanges of land between the Applicant and the Forest Service may help facilitate the increase in blocks of Federal LSR lands having

interior forest conditions within the Planning Area. Structural retention, as documented in the Applicant's New Forestry experiments, has provided more effective "patches" which can support a more diverse assemblage of species than conventional harvest units. Additional language regarding the intent of certain management actions by the Applicant for managing patch size has been added to the HCP (Section 3.5.1.1, see FEIS Appendix 4). The Services believe that an acceptable balance has been reached between the provision of interior habitat conditions and timber production, given the distribution of land ownership in the Planning Area.

C. Plants

1. Listed Plant Species

Comment Summary:
The Sierra Club-Cascade Checkerboard Project commented that the HCP inadequately addresses the consequences of proposed activities on threatened, endangered, and sensitive plant species and the Washington Native Plant Society suggested that the HCP should provide for some protection of rare plants and asked how areas where rare plants were identified by the Washington Natural Heritage Program would be managed.

Services' Response:
This HCP only addresses vertebrate animal species. Implementation of the HCP would result in the Applicant conducting forest-management activities according to their Environmental Principles which are expected to provide protection for sensitive plant species. The Proposed Plan maintains a diverse distribution of stand structural stages and protection of special habitats. As mentioned in the DEIS, serpentine soils are unlikely to be harvested or disturbed. The Applicant would, to the extent practicable, maintain conditions suitable for sensitive plant species through harvest management and cooperation with State and Federal wildlife agencies (see DEIS Section 4.7.3). The Services will analyze effects to listed plant species in its section 7 consultation.

2. Sensitive and Culturally Significant Plant Species

Comment Summary:
The Wenatchee National Forest requested additional analysis of the impact of the Proposed Action on fungi and bryophyte species of concern in the Northwest Forest Plan. One individual, on a preprinted card, urged protection of rare plant communities, such as bogs.

Services' Response:
This HCP only addresses vertebrate animal species. During the biological opinion conducted under section 7 of the ESA regarding the Northwest Forest Plan, a worst-case scenario was assumed for the intermingled and adjacent nonfederal lands. It was assumed that those lands would be heavily harvested; however, harvest protections in place for owls would not be completely alleviated. The viability assessments referred to in the comment (FEMAT and SAT) made similar assumptions in their viability analyses. The Spotted Owl Recovery Plan and the proposed 4(d) Special Rule for spotted owls discussed goals for private lands in this particular landscape which include both dispersal and demographic support. The Preferred Alternative provides for both of those functions, other alternatives may or may not. An analysis for these species has been added to the DEIS (see FEIS Section 2, new DEIS Section 4.7.4). Bogs under 5 acres

in size will receive protection equal to State Forest Practices Regulations; bogs greater than 5 acres in size will receive greater protection than current State Regulations (see HCP Section 3.4.1 in FEIS Appendix 4).

3. Exotic Species

Comment Summary:
The National Audubon Society requested additional analysis of the HCP in terms of invasions by exotic species; Washington Native Plant Society and Washington Environmental Council commented that road building and harvesting from planned logging in the HCP provide routes for invasion by noxious weeds and invasive early successional animals.

Services' Response:
At present, exotic species do not represent a quantifiable threat to species addressed in the HCP. The Applicant uses seed mixes with native grass and forb species to stabilize banks and reclaimed roads. Barred owls are thought by some to be "exotics" to the area and were discussed as possible competitors to the spotted owl in the HCP (Section 2.10.1.4). Concerns that roads and harvest units may provide access routes for corvids and other species which might prey on the nests and young of late successional species has not been validated in over five years of active spotted owl and wildlife monitoring in the Planning Area. Increases in exotic plant or animal species which may threaten species in the future would be addressed under the "Unforeseen" or "Extraordinary" Circumstances (depending upon severity) in the Implementation Agreement (HCP Sections 5.3.1 and 5.3.2; Appendix 10). The State lists plants considered noxious weeds and regulations are in place for their control (WAC-16-750). Noxious weeds and other introduced plant species have not posed problems in the past in areas converted to earlier successional stages from timber management by the applicant within the Planning Area. Due to replanting harvest units quickly and in high densities, these early successional areas are temporary, transitioning to later stages with closed canopies. Conditions that favor early successional plant species are replaced by conditions that favor more shade-tolerant species. Invasive animals are typically considered as pests in urban settings and include species such as pigeons, European starlings, and American crows, and would not be expected to be problems in timber- management areas away from urban areas.

D. Animals

1. General Wildlife

Comment Summary:
Fourteen individuals (six comments on preprinted cards) commented on general wildlife issues. Comments included that the HCP should ensure the survival of the 285 known species identified in the HCP for the area, stated that the HCP creates long-term uncertainty for wildlife, asked how the HCP specifically improves wildlife and fish habitat over the existing conditions, noted that downed logs and snags provide hiding and breeding cover for many animals, that elevation or geographic restrictions to the distributions of species was not addressed in the HCP, and urged that steps be taken to protect our native species. One individual commented that the decline in old-growth in the Planning Area due to the spotted owl strategy in the HCP would fragment habitat for mammals.

Services' Response:
Measures in the HCP to protect habitat for Permit Species, Special Emphasis Species, Species of Concern, and Associated Species have been determined by the Services to provide for the needs of these species and are expected to result in sustaining populations of these species in the Planning Area. This is based on

review of the HCP and analysis of likely impacts to listed species from the Applicant's activities by Service biologists. Analysis of impacts to the Permit species in the HCP would be considered in more detail by the Services as part of the section 7 consultation and would use different methods of analysis than those used by the Applicant. The 285 species considered in the HCP are all native species. Elevation and geographic restrictions to the distribution of species was considered in the HCP in the process of developing the species/habitat matrix, development of Lifeforms, and analysis of habitat for Permit Species, Special Emphasis Species, Species of Concern, and Associated Species (see HCP Section 2.10).

The HCP improves fish and wildlife habitat over existing conditions by providing greater protection of habitat than required by current State Forest Practice Rules and Regulations for many landscape elements (e.g., riparian areas, caves, talus slopes, wetlands, green tree and snag retention), implementing specific management actions for certain species (e.g., BMPs for grizzly bears, goshawk nest site harvest deferrals, road management for wolves, big game, and watershed concerns), and acceleration of watershed analysis in the Planning Area to address concerns for fish and water quality-related issues. These measures allow for a level of certainty for habitat protection not present if current regulations are followed. For example, under current regulations, spotted owl habitat can be harvested by the Applicant if survey results for three years fail to detect a spotted owl in the management circle. These regulations only provide incentives for the Applicant to harvest the owl habitat and prevent regrowth of forest stands to a condition suitable for spotted owls. See additional discussion of the No-Action Alternative in FEIS Section 6.0. Also, see Response to Course Woody Debris and Snag Concentrations for additional information regarding the provision of these habitat features in the HCP. See Responses for Patch Size and Interior Forest for discussion of habitat fragmentation consideration in the HCP.

a. Mammals

(1) Bats

Comment Summary:

The Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, and three individuals commented on issues regarding bats. Comments included that the lumping of *Myotis* bats in the HCP for discussion and analysis purposes is inappropriate due to species specific differences in range and habitat use, cave buffers are inadequately defined, areas adjacent to reservoirs should be given special consideration for protection (Lake Cle Elum), requests for the basis of the 25-foot buffer, requests for why buffers are not proposed for nurseries and other roosts, failure of the HCP to address pesticide use, since Townsend's bats use roosts other than caves, impacts analysis for this species is inadequate if based on only known caves within the Planning Area. One commentor noted that Thomas and West (1992) were misinterpreted on page 178 of the HCP; their study found no reproductive female bats above 300-meters in the western Cascades of southern Washington. This commentor stated that the HCP does not address elevation restrictions for these species. Other comments included that by reducing old-growth with implementation of the Plan, species such as bats would suffer from reduced habitat and that surveys should be conducted to confirm the occurrence and abundance of *Myotis* species.

Services' Response:

The inclusion of several *Myotis* bat species into one group for describing their ecological requirements and impacts from the HCP was appropriate because of similarities between the species in habitat needs and ranges. Specific differences between species were discussed in HCP Section 2.10.5.4 and relevant differences were considered in evaluation of impacts to these species from the Applicant's activities. Caves have been further defined and the protection zone around caves has been expanded from 25-feet to 100-feet in response to public comments and discussions with the Services (see Response to Caves and FEIS,

Appendix 4, Section 3.4.3). RHAs, spotted owl deferrals, and green tree and snag retention measures in the HCP would provide snags that may serve as roosting sites for bat species. Where large reservoirs are included in the Planning Area, minimum 200-foot RHAs would be established and provide potential snags for roosting sites. Known information concerning the Townsend's big-eared bat suggests this species is mainly associated with caves and rock shelters or man-made structures providing cavities or cave-like habitat. Caves discovered in the Planning Area would be protected (see above). Additional habitat protection has been included in the HCP by the Applicant directed toward Vaux's swifts, fishers, and marten that would also benefit bats. Hollow snags, identified during harvest layout and design, would receive priority for retention consistent with State worker safety rules (see FEIS, Appendix 4, Section 3.4.4). The Applicant does not currently use or anticipate future use of pesticides as part of its activities. Use of herbicides by the Applicant has been addressed in HCP Section 1.2.3.3. Old-growth would not be effectively reduced in the Planning Area (see HCP Table 30) and protection measures identified above should sustain populations of bat species where they occur in the Planning Area. Habitat protection measures in the HCP would avoid or minimize impacts to these species so that specific surveys for confirmation of occurrence and abundance are not necessary. Clarification has been added to the HCP which indicates that Thomas and West (1991) found no reproductive bats during their study of sites located between 300 and 600 meters elevation in the western Cascades.

(2) Other Small Mammals

Comment Summary:

One local organization and one individual commented on issues regarding small mammals. One commentor asked why Plum Creek is surveying for owl prey species in old-growth when most of the time most of the Planning Area would be in Dispersal Forest. Other comments included that old-growth forests are important for providing hypogeous fungi that voles forage on and by reducing old-growth with implementation of the Plan, species such as squirrels, shrews, and voles would suffer from reduced habitat. It was noted that small mammals play an important role in dispersing fungal spores in their fecal pellets and little cover and forage is provided by recently clearcut areas.

Services' Response:

As part of the HCP, the Applicant would survey both dispersal and managed old-growth structural stages for spotted owl prey densities to verify that adequate prey levels are present to sustain spotted owls. Managed old-growth was included in these surveys since this structural stage is often a result of selective harvesting in old-growth stands and represents a modification of forest conditions. See HCP Section 5.2.3 for more detailed information. Habitat protection in the HCP by the Applicant, specifically RHAs and maintenance of spotted owl habitat, is expected to provide the conditions necessary for sustaining populations of small mammal species such voles, squirrels, and shrews. Old-growth in the Planning Area would not be effectively reduced during the Permit period (see HCP Table 30). Even-aged harvesting is only one technique employed by the Applicant in managing forest stands and other uneven-age and shelterwood harvesting would provide a variety of habitats for small mammals (see HCP Section 1.2.3.1).

(3) Canids - gray wolf, coyotes, foxes

Comment Summary:

The WDFW, Yakama Indian Nation, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, three local organizations, and 11 individuals (one comment on a preprinted card) commented on issues related to the gray wolf. Comments included that the HCP should provide at least State Forest Practices Rules and Regulations for gray wolf protection, impacts are not minimized or not adequately

estimated for wolves, more documentation is needed to assess impacts, no monitoring or population projections are provided for wolf populations, den buffer protections are inadequate, HCP activities are designed to keep wolves off the Applicant's land by downgrading the quality of habitat, no justification is provided for the three-den limit on the Applicant's land, and open road densities should be reduced for wolves. One commentor suggested that six wolf packs elsewhere in the State should not release the Applicant from conservation responsibilities and that roadless areas are important to wolves. One commentor was pleased with provisions for wolves in the HCP. More information was requested on explaining the timing restriction dates around wolf dens and buffer distances and comparisons to guidelines for other states where wolves are present, how rendezvous sites would be protected, and how large a management unit containing a den site would be deferred from harvest?

Services' Response:
Development of mitigation measures for the gray wolf in the HCP includes features to protect den sites, provide for prey habitat conditions, and road management strategies (see HCP Section 3.2.1.4). The Services expect that the combination of these measures would provide adequate protection of ecological requirements for this species. Measures that provide for wolf prey and create more secure and less disturbed (from human activities) habitat through road closures upon implementation of the HCP would enhance conditions for colonization of the Planning Area. Dates for timing restrictions surrounding wolf dens were developed from information presented in (Mech 1970; The Gray Wolf). Buffer distances and operational restriction guidelines were developed from experience and monitoring of active den sites by the Applicant on timber lands in Montana. Since the future locations of wolf dens are unknown at the present, the exact size of management units that would be deferred from harvest are also unknown. However, the average size of management units on the Applicant's land is approximately 40 acres. The limitation for deferrals at three active den sites at any one time by the Applicant and reevaluation of protection strategies when six packs elsewhere in the State are established was determined by the Services through negotiation with the Applicant in lieu of established goals for this area. In addition to colonization of the Applicant's land, den sites are expected to be established on Federal lands in the Planning Area. Open road densities would be reduced by the Applicant on their lands to 1.0 mile per square mile in the I-90 Lakes Subunit for grizzly bear protection and would also benefit wolves (see HCP Section 3.2.1.3). Road closures by the Applicant in the Taneum Creek drainage for big game hunting issues would be continued and road-management efforts increased to benefit wolves (see HCP Section 3.2.1.4). Rendezvous sites would be protected from disturbance by the Applicant through consultation with the Services and may include operational timing restrictions or road closures. Because of the many factors beyond the Applicant's control that may influence wolf recolonization of the Planning Area, no population projections can be determined for the Planning Area during the Permit period. Monitoring of some den sites by the Applicant may occur as part of the wolf management plan, but monitoring of wolf populations in the region is beyond the scope of this HCP and not necessary to address impacts from the Applicant's activities in the Planning Area.

(4) Ursids - grizzly bear

Comment Summary:
The WDFW, Yakama Indian Nation, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, three local organizations, and ten individuals (one comment on a preprinted card) commented on issues related to the grizzly bear. Comments included that the HCP should provide at least State Forest Praxctices Rules and Regulations for grizzly bear protection, impacts are not minimized or not adequately

estimated for bears, more documentation is needed to assess impacts, no monitoring or population projections are provided for bear populations, HCP activities are designed to keep grizzly bears off Plum Creek's land by downgrading the quality of habitat, RHAs are inadequate for bears and should be increased in width, enough old-growth habitat should be protected to sustain healthy populations or bears, roadless areas are important to grizzlies, and open road densities should be reduced for bears, especially in roadless areas. One commentor was pleased with provisions regarding road density and access for bears in the HCP. Some commentors recommended that Phase II measures be implemented immediately as a proactive step to encourage grizzly bear colonization of the area. One commentor noted that sightings in the Lake Kachess area and in the southern Cascades suggests there are resident grizzly bear populations in these areas and a wildlife corridor should be established to allow movement between the areas. One commentor stated that grizzly bears have recolonized the Glacier Peak Wilderness Area and that the Planning Area, without wildlife travel corridors, may be an impediment to the grizzly eventually re-colonizing land south to the Columbia River. One commentor noted that there is judicial precedent that the HCP grizzly bear management may not be providing adequate protection measures.

Services' Response:
State Forest Practices Rules and Regulations regarding grizzly bears only restrict activities surrounding active den sites. Grizzly bear den sites are likely to be in upper elevation zones where deep and long-lasting snow provide suitable den sites. These areas are likely to be unsuitable for timber harvest and impacts from the HCP avoided or minimized. Measures in the HCP for grizzly bears (see HCP Section 3.2.1.3) would enhance the potential for grizzly bear recolonization of the I-90 Lakes Subunit of the Planning Area and would maintain and further enhance habitat when grizzly bears are inhabitants. Phase I BMPs are a proactive step towards grizzly bear colonization and include reducing open road density. Old-growth and other later structural stages would be available on both the Applicant's land and Federal lands to provide forest cover habitat for bears. Class 1 "confirmed" sightings of tracks and individual adult grizzly bears have been documented for the I-90 Lakes Subunit (see HCP Section 2.10.3.3) but no documented sightings have been reported for areas south of this region in Washington. Information on grizzly sightings should be reported to the WDFW. Federal recovery plans for the grizzly bear in Washington State have targeted the North Cascades as a Recovery Zone. Measures in the HCP for grizzly bears have been developed to be consistent with the Recovery Plan. The establishment of travel corridors for grizzly bears to areas outside of the Recovery Zone are not addressed in the Recovery Plan. Because of the many factors beyond the Applicant's control that may influence grizzly bear recolonization of the Planning Area, no population projections can be determined for the Planning Area during the Permit period. Monitoring of bear populations in the region is beyond the scope of this HCP and not necessary to address impacts from the Applicant's activities in the Planning Area.

(5) Mustellids - wolverine, fisher, marten, otter

Comment Summary:
The Wilderness Society commented that the HCP and DEIS do not thoroughly assess the impacts of forest management on connectivity of habitat for the wolverine in the I-90 corridor. One local organization and one individual suggested that the HCP needs to discuss in more detail the habitat needs of fishers and provide more habitat. Another individual suggested that old-growth forest is one of the few proven safeguards we have for continued health of endangered and threatened species like fishers. One individual commented that population trends for fisher and wolverines are unknown in the Planning Area and impacts of forest management are not fully understood. Another individual remarked on the impact to otters from the decline in old-growth.

Services' Response:
Needs of wolverines for connectivity of habitat in the I-90 corridor are expected to be met by deferral areas for spotted owls on the Applicant's land as younger stands grow into more mature stages and by establishment of RHAs. Road closures for grizzly bears would benefit wolverines; disturbance from human activity is thought to be the largest concern in management for wolverines. Based on discussions with the Services and WDFW and in response to public comments, additional habitat protection has been included in the HCP by the Applicant directed toward Vaux's swifts, fishers, and martens (see FEIS, Appendix 4, Section 3.4.4). Hollow snags, identified during harvest layout and design, would receive priority for retention consistent with State worker safety rules. Old-growth forest would be available on the Applicant's land and in larger patches on Federal lands in the Planning Area (see HCP Table 30). Riparian strategies and older stands in RHAs would benefit otters.

(6) Goats and sheep

Comment Summary:
One individual commented that the Cle Elum River property is an important wintering area for big game. Another individual commented that old-growth forests provide travel corridors and are important as thermal cover for goats during migration.

Services' Response:
The comment is noted regarding the big game wintering area along the Cle Elum River. See the Response for Location and Boundaries. Any future development plans by the Applicant for these lands outside the Planning Area would undergo appropriate environmental review by local, State, and Federal agencies as relevant regulations require. Patches of forest cover among cliffs and rock slopes that provide cover for goats are expected to persist due to the operational difficulty and worker safety considerations that harvest of these areas entails. Primary habitat for Lifeform 4 includes older stands in units with greater than 25 percent rock and remain in adequate amounts through the Permit period.

(7) Deer and elk

Comment Summary:
The Northwest Ecosystem Alliance commented that road mileage should be reduced to 1.0 mile/square mile to provide additional protection for elk. One individual commented that much of the habitat for elk and deer in the Planning Area is above the preferred wintering elevation and for this reason, some consideration should be given to habitat in relation to periods of use. Another individual commented that travel corridors along the Cascade crest are especially important to deer and elk, and that clearcuts are only temporarily beneficial to deer and elk, because some species rely on ephiphytic lichens from old-growth forests as winter forage.

Services' Response:
Open road densities would be reduced by the Applicant in the I-90 Lakes Subunit for grizzly bear management (see HCP Section 3.2.1.3) and would benefit elk. The Applicant currently is involved in cooperative road closures with the State in the Taneum Creek drainage for big game during the hunting season. Though the HCP is a multi-species plan, the Services recognize that there are certain trade-offs when attempting to manage for a variety of species with differing habitat needs. Habitat management in this HCP directed toward the spotted owl results in decreasing the amounts of early successional structural stages that serves as foraging habitat for deer and elk. Foraging and thermal cover habitat would be available in all elevational areas used by deer and elk and are expected to allow for movement of animals between seasonal use areas. Old-growth and other late successional stands that provide

thermal cover and winter forage would be available both on the Applicant's and Federal lands during the Permit period (see HCP Table 30, Figures 46, 47, and 48).

b. Birds

(1) Aquatic birds (other than the marbled murrelet)

Comment Summary:

The Wenatchee National Forest, WDFW, Sierra Club-Cascade Checkerboard Project, and one individual commented on issues regarding aquatic bird species. The comments included that the common loon and great blue heron should be added to the list of Species of Concern in the HCP and protection plans for breeding sites addressed. One commentor recommended that black terns not be included in the Unlisted Species Agreement since habitat in the lower Cle Elum/Yakima River areas were excluded from the HCP. Comments specific to harlequin ducks included requests for information on the frequency of ground nesting and under what conditions it takes place, if habitat for prey species (invertebrates) is adequately protected, what level of use of intermittent streams occurs by harlequins, what acreage of the HCP is considered primary and secondary habitat, and if seasonal restrictions are planned to avoid disturbance during nesting. Commentors noted that there is an inconsistency between Technical Report No. 8 that recommended the avoidance of harvesting in riparian areas and the HCP which allows harvesting in riparian areas and that population trends in the Planning Area and impacts of timber management not known or fully understood. Others recommended that sighting information regarding harlequins from the SPAMA Plan be incorporated into the HCP.

Services' Response:

The Services expect that adverse impacts to common loons would not occur as a result of the Applicant's activities because of this species' likely habitat use in the Planning Area and measures in the HCP such as RHAs that would protect breeding areas. Common loons would be expected to breed in the large reservoirs or other larger bodies of water in the Planning Area which would be buffered by a minimum 200-foot RHA. Great blue herons typically nest near feeding areas in proximity to water and RHAs and forested wetland protection in the Planning Area would provide breeding sites across the landscape for this species. Should black terns become federally listed in the future, protection for this species in areas outside of the Planning Area would be governed by ESA guidelines. Any habitat likely to be used by black terns within the Planning Area would be protected by RHAs along the large rivers and lakes. The Services expect that adequate habitat would be available on the Applicant's land due to the provision in the HCP of RHAs that would provide snags, large trees, and shrub cover for loafing and nesting sites. Though some selective harvesting would be conducted in RHAs outside of the 30-foot, no-harvest zone, important landscape elements for harlequins would be retained and only one entry into RHAs would occur during the Permit period. Seasonal restrictions of activities near harlequin breeding sites were not included in the HCP. Measures in the HCP to protect fisheries and water quality issues would also protect aquatic invertebrates, the principal forage base of harlequins during the breeding season (see Response to Aquatic Invertebrates). The Aquatic Resource Monitoring program in the Planning Area would assess aquatic insects through research and is further described in HCP Sections 3.3.5 and 5.1.6. RHAs and wetlands total more than 12,000 acres of the Applicant's lands in the Planning Area (HCP Section 3.3.3) and a breakdown of primary and suitable habitat for the harlequin duck (Lifeform 3) is provided in HCP Table 26. Sighting information regarding harlequins in the SPAMA Plan have been noted.

(2) Marbled Murrelet

Comment Summary:
The WDFW, Northwest Indian Fisheries Commission, Puyallup Tribe of Indians, Yakama Indian Nation, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, three local organizations, and seven individuals commented on issues related to marbled murrelets. Comments and questions included that insufficient protection and impacts analysis is provided in the HCP for murrelets, surveys for murrelets are limited and clarification is needed regarding survey standards, and ownership of the surveyed areas, no maps were provided showing potential murrelet habitat, recommendations that the entire Planning Area be surveyed or that surveys should be ongoing through the Permit period, and that activities in the HCP are designed to keep murrelets off Plum Creek's land by downgrading the quality of the habitat. No population projections are provided for murrelets. The Kelly Butte area should be preserved for the development of murrelet habitat. One commentor requested information on the condition of riparian areas and critical habitat on Federal lands in the Planning Area and how well they provide murrelet habitat.

Services' Response:
Extensive habitat surveys to determine the suitability for murrelets of Federal lands in the Planning Area have not been conducted. Proposed critical habitat designated for areas in and near the Planning Area is presented in HCP Figure 6. Surveys of the most suitable murrelet habitat on the Applicant's lands are part of the HCP mitigation plan for the murrelet and HCP Section 3.2.1.2 and Technical Report No. 2 describe survey methodology. Locations of the surveyed stands are presented in HCP Figure 19. These surveys include all of the Applicant's lands up to the Cascade crest determined to be the most suitable for murrelet use. Should murrelets be detected, the Services believe that protection of the stands would be adequate; additional clarification of protection measures have been added to the HCP (see FEIS, Appendix 4, Section 3.2.1.2). Through negotiation with the Applicant and development of the mitigation plan for murrelets, the Services are not requiring ongoing surveys through the Permit period. Old-growth structural stages are non-declining on the Applicant's lands during the Permit period (HCP Table 30). Based on public comments and discussions within the Services, additional clarification regarding the ownership of surveyed areas, criteria for determining suitable habitat, and information regarding the exclusion of certain stands have been added to the HCP (see FEIS, Appendix 4, Section 3.2.1.2). Because of the many factors beyond the Applicant's control that may influence murrelet use of the Planning Area, no population projections can be determined for the Planning Area during the Permit period. The Applicant's activities are not designed to prevent murrelets from occupying their land; spotted owl deferrals in the Green River Valley may also serve as murrelet habitat. Future land exchanges between the Applicant and the Forest Service may help to facilitate the increase in blocks of Federal land that may provide suitable murrelet habitat in the future on LSR or AMA designated Forest Plan landscapes.

(3) Owls - general

Comment Summary:
The Yakama Indian Nation and the Sierra Club-Cascade Checkerboard Project commented on the HCP analysis of owl species other than the spotted owl. Comments noted that the needs of flammulated owls were not addressed adequately and more protection of larger snags is required. A commentor stated that the HCP does not provide protection of natural openings and meadows for the great gray owl that are provided for in the Northwest Forest Plan.

Services' Response:
Flammulated owls are primarily associated with Ponderosa pine forests. The Applicant has added this Special Habitat to the HCP. The Applicant currently utilizes selective harvesting in Ponderosa pine stands where such techniques are operationally and silviculturally appropriate. The Applicant's continued use of selective harvesting would result in multi-aged stands over the Permit period. Where development of a multi-aged forest is not possible, the Applicant would enhance opportunities for biological diversity by leaving trees of various size classes, as well as existing snags and snag recruitment trees. Natural openings and meadows which may be used by great gray owls are generally considered "nonforested" in the Applicant's forest inventory and were not considered to be adversely affected by operations contemplated in the HCP. Stand structure stage amounts for the Ponderosa pine/Lodgepole pine Forest Class in the Planning Area is presented in Table 30b, appended to the HCP in FEIS, Appendix 4.

(4) Spotted Owl - general

Comment Summary:
The WDFW, Northwest Indian Fisheries Commission, Yakama Indian Nation, Defenders of Wildlife, National Audubon Society, Washington Environmental Council, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, seven local organizations, and 19 individuals (one comment on a preprinted card) commented on general issues regarding the spotted owl. Questions and comments included that the HCP does not fully protect spotted owl populations or owl habitat and would cause their decline or extirpation, the HCP provides inadequate mitigation and corrective action is delayed until a net detriment to the population would be uncorrectable, the No-Action Alternative provides better protection, the HCP ignores east side and west side differences in owl populations and the important Cle Elum owl corridor, and urged no logging or clearcutting of owl habitat. Information requests included maps of all habitat reserves for owls, requests for clarification of "seasonal protection" measures, requests for more detail of how more owl habitat would exist in 50 years and the benefits of having more dispersal habitat on the landscape, and requests for clarification of deferral unit sizes and amounts due to discrepancies in the documents. Comments related to the ecology of the spotted owl include that they may show nonlinear population responses at low population levels, predation impacts are inadequately addressed in the HCP, and spotted owls are indicator species of old-growth habitat.

Services' Response:
Demographic trends for spotted owls in the Cle Elum area, which includes the Planning Area, are currently under review by the Applicant. The most recent data reported by the DNR in their EIS on the proposed State spotted owl rule states that the "lambda" value estimating rate of population change is "not statistically different from 1.0 and suggests that the owl population in the Planning Area is not declining (DNR EIS, page 2-51). Concerns that the reduction of owl habitat contemplated in the HCP would lead to unacceptable population declines is speculative and would be analyzed in more detail in the Services' section 7 consultation. Current and anticipated State and Federal regulations and guidelines (i.e., 1.8-mile radius management circles) would not avert a reduction in spotted owl habitat, because habitat outside of circles, and above threshold within circles would continue to be harvested by State and private landowners, including the Applicant. Moreover, there are no Federal regulations that define "take." For this reason, site specific actions in the future would be judged on a case-by-case basis. Accordingly, habitat below thresholds may be harvested if harm to spotted owls would not occur. The current regulations alternative (i.e., No-Action) displayed in the DEIS was conservative and assumed "no net loss" of circles and owl sites. In reality, 14 sites are currently without protection circles or would lose their protective circles shortly because of documented absence through surveys. Analysis of the current regulations alternative

has been revised to reflect this information (see FEIS Section 2, DEIS Section 4.8.1.1; No-Action Alternative). East and west side Cascades habitat differences were accounted for in both the definition of owl habitat (HCP Section 2.4) and construction of the RPSF model with incorporation of Fire Management Analysis Zones (2-5) to reflect different elevation, topographic, and precipitation zones where spotted owls occur in the Planning Area (Irwin and Hicks 1995). Concerns about seasonal limitations around nest sites have been addressed by the Applicant by adding the restriction dates of March 1 to August 31 within 0.25-mile of an active nest.

(5) Spotted Owl - deferrals

Comment Summary:

The Northwest Indian Fisheries Commission, Yakama Indian Nation, Puyallup Tribe of Indians, Sierra Club-Cascade Checkerboard Project, three local organizations, and 13 individual letters (plus 424 preprinted cards) commented on the issue of spotted owl deferrals. Questions and comments included that deferrals were not large enough or were too few, urged that additional or all owl sites be included with deferrals or that back-up sites also be included with deferrals, and that deferrals should be for the entire 50-year Permit period (i.e., length of the first phase of the Permit). One commentor recommended that deferrals be included at sites outside of LSRs and AMAs if they are productive. One commentor suggested that logging near all owl sites be deferred until impacts from the Recissions Rider are analyzed. Commentors requested clarification regarding whether the deferral areas are included in the 8 percent NRF commitment by Plum Creek on its lands and whether deferral areas would be maintained for the entire first phase of the Permit period.

Services' Response:

The rationale for designating NRF deferrals and FD corridors is described in HCP Section 3.2.1.1. It is erroneous to assume that deferrals and corridors are "isolated" from other patches of habitat, either on the Applicant's land or on Federal and State lands. Consequently, size as a criteria for adequacy must be taken in context with the total amount of habitat present for each site center. The issue of amount and location of deferrals would also be evaluated in the Services' section 7 consultation on the HCP. Alternate deferrals, additional deferrals, or time extensions for deferrals can be identified or revised during the Permit period if biological data or Extraordinary Circumstances dictate a revision (see HCP Section 5.4.3.2 and Appendix 10, item 2.5). Although prioritized for AMAs and LSRs, some deferrals were located near productive sites in the federally designated Matrix south of the Green River and would be incorporated by the Applicant in the spotted owl monitoring program (HCP Section 5.1.2, as revised). Impacts of the Recision Rider authorizing salvage logging on Forest Service land are not an issue in the Planning Area, since there are no salvage sales or "318" sales identified on any Forest Service lands in the Planning Area. However, the Services remain concerned about these sales and will consider these sales and their impacts during identification of the baseline during the section 7 consultation. The deferrals are part of the NRF percentages estimated to be on the Applicant's ownership for the first 20 years of the Permit period (i.e., First Phase) (HCP Table 24). It is at the Applicant's discretion whether the deferrals are to remain past the 20 year deferral period and be counted toward the 8 percent minimum identified in HCP Section 3.2.1.1.

(6) Spotted Owl - population impacts and models

Comment Summary:

The WDFW, Northwest Indian Fisheries Commission, Yakama Indian Nation, National Audubon Society,

Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, Washington Environmental Council, six local organizations, and 37 individuals (plus 424 preprinted cards) commented on issues regarding spotted owl population impacts from the HCP and models used in the analysis. Questions and comments included that the HCP should not allow a reduction in the owl population, impacts to the population are underestimated and a dramatic decline would result from implementation of the HCP, not enough owl pairs or habitat for a greater carrying capacity is protected, no owl surveys are provided after 20 years, data analysis of survival rates is based on too short an observation time, no sufficient population level for the Planning Area is identified, and no margin of error to population impacts is provided in the HCP. The WDFW took issue with the filter system and asserted that a possibility of take still remained for a number of sites identified at filter stages. The WDFW further recommended that assessment of take be based on Service guidelines. WDFW recommended only using NRF for take assessment unless the usable portion of FD can be identified. Some commentors stated that one spotted owl take per year during the Permit period was too high or that take would occur in two-thirds of all owl sites in the first 20 years, and all 88 sites after 20 years. Requests were made to explain how the owl would survive the loss of habitat in the first two decades of the Plan and how the HCP impacts to owls would influence the regional population. Comments specific to the RSPF model used to analyze impacts to spotted owl populations in the Planning Area noted that the RSPF model is unproven, flawed, and inappropriate, does not factor in a declining owl population for the Cle Elum study area (Fort Collins analysis results) or identify the rate of change in the Planning Area owl population, does not factor in predation impacts or habitat trends, no model verification plan is provided, and questioned the use of 0.7-mile circles in the model when so many telemetry relocations are outside of this circle area.

Services' Response:

From a landscape perspective, the minimum level of NRF habitat estimated over the Permit period (HCP Tables 23 and 24) varies only 2 percent between the conservative "current regulation" Alternative (25 percent) and the HCP (23 percent), suggesting that reductions in owl habitat under the HCP would not be severe. However, because the No-Action Alternative is so variable and conservative, it might provide less NRF habitat than the Proposed Action. Concerns about the lack of spotted owl surveys past year 20 of the Permit period have been addressed by adding more surveys out to year 40 (Table 31, as revised, see FEIS Appendix 4). Survival rates of spotted owls in the Planning Area reflect the most continuous monitoring of this variable for any owl population in the State of Washington and are comparable to monitoring periods used in recent demographic analyses for other spotted owl populations in Oregon and California. A "sufficient" population level for spotted owls in the I-90 corridor has never been identified; surveys continue to discover more pairs than were previously expected. In fact, known pairs to-date exceed the original estimate of a recovered population set forth in Thomas (1990). The HCP was designed, in part, to support the draft Spotted Owl Recovery Plan which is the most recent attempt to establish the population size and habitat configuration favorable to owls (see HCP Section 3.5.1.1). It is unclear how the commentors arrived at impacts to 88 sites in 20 years when many of these sites are currently not valid site centers (i.e., lacks pairs or resident singles) and likely would not be during the Permit period, or the Applicant has minimal contribution to habitat support for the site. The assessment of "take" includes possible impacts that would only "slightly impair" the site and not result in displacement of the resident owls. Concerns that "take" of owl sites would be excessive is based on the assumption that owl sites would remain "static" and fixed in location for the 50-year Permit period. This assumption is erroneous and is not shared by the Interagency Spotted Owl Committee, the Spotted Owl Recovery Team and other scientists that have developed landscape plans for spotted owls. In those plans, the assumptions have included the movement of owls to areas of available habitat as forested stands develop in the future. As

stated earlier, the question of excessive "take" would be assessed in the Services' section 7 consultation using analysis techniques independent of those used in development of the HCP. The Services continue to believe that, as a result of the Proposed Plan, take in the order of 50 sites over the 50-year Permit period (i.e., First Phase) is a likely occurrence. However, the Services now believe that the number owl sites taken would not be equally distributed throughout the Permit period, but rather, greater take may be evident earlier in the Permit period. Analysis using the "40 percent threshold" indicates that approximately 15 owl sites may be at risk of take during the first decade, approximately 10 sites per decade during the second and third decades, and fewer than 5 sites per decade thereafter. These estimated take amounts do not differ substantially by alternative. For instance, 15 sites are also at risk during the first decade under the No-Action Alternative.

The RSPF model was not applied correctly in examples provided by reviewers. The RSPF model's theoretical basis and mathematical structure are geared for estimating the average probability across a *landscape,* not an individual site. The model cannot be applied accurately when only used to assess the conditions at a single site, but instead must be applied across a landscape. Demographic trends for spotted owls in the Cle Elum area which includes the Planning Area are currently under review. The most recent data reported by the DNR in their EIS on the proposed State spotted owl rule states that the "lambda" value estimating rate of population change is not statistically different from 1.0 and suggests that the owl population in Planning Area is not declining (DNR EIS, page 2-51). Predation on spotted owls is discussed in HCP Section 2.10.1.3, and occurs in a variety of situations and from a variety of sources (e.g., great horned owls, goshawks) in the Planning Area. There is no pattern to predation that allows for predictive effects on spotted owl populations. Contrary to reviewer comments, verification of the RSPF model is addressed in both the monitoring program (HCP Section 5.1.2) and the Adaptive Management section (HCP Section 5.4.3.2). The use of 0.7-mile circles in the model was based on the fact that habitat and physical characteristics within the Planning Area provided the most reliable basis for correct classifying random vs. owl sites. Use of 0.7-mile circles in the model did not imply that all habitat needs for the owl are met in that circle.

The Services acknowledge that for several filter stages that take is a possibility, but believe take becomes less likely or would be of a lower impact than for other filter stages. The Services prefer to consider the filter system a prioritization tool to assess potential impact. The Services will further assess impacts on owls during section 7 consultation and will use existing guidelines and other standards to assess the amount of take. The Services concur with the use of NRF and suitable FD, but will primarily base assessments on NRF to be conservative.

(7) Spotted Owl - NRF habitat (quality/definition, amounts, distribution)

Comment Summary:

The Wenatchee National Forest, WDFW, Northwest Indian Fisheries Commission, Yakama Indian Nation, National Audubon Society, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, four local organizations, and 59 individuals (plus 424 preprinted cards) commented on issue relating to NRF owl habitat. The most frequent comment was that the HCP should retain more nesting habitat for the spotted owl. Some comments recommended that current NRF habitat not be harvested until the regrowth of habitat becomes suitable. Other comments include that the existing NRF habitat is not a biologically viable baseline for analysis and that Federal standards for NRF habitat should be applied to critical corridors and potential land exchange areas. Comments concerning regrowth of NRF habitat were

that it is overly optimistic, only estimated for the future, is inaccurately predicted on Federal lands in the future, and is unproven to contain the characteristics needed by spotted owls or would be too fragmented to be used by spotted owls. Comments relating to the definition of NRF habitat in the HCP include that the definition is different from Federal plans, does not include all appropriate habitat characteristics needed by spotted owls, and should not include the Mature Forest structural stage. Comments on the distribution of NRF habitat include that the HCP provides no discussion of where the NRF habitat would be located or if patches would be large enough, the relationship of NRF habitat to Federal DCAs, no analysis of the effects of fragmentation or short-term versus long-term NRF distribution is provided in the HCP, and that clustered habitat would not benefit owl populations.

Services' Response:
The Applicant's analysis revealed that increasing the amount of spotted owl habitat on the Applicant's lands necessary to maintain or increase existing population numbers carried an unacceptable economic impact, as well as negative tradeoffs to other wildlife species. The primary emphasis of the HCP, relative to spotted owls, is to reduce the impact of short-term harvest of spotted owl NRF habitat (with harvest deferrals and corridors) while maintaining an economically acceptable level of NRF habitat over the long-term with more dispersal habitat to reduce the potential for fragmentation and isolation of the owls using future landscapes. Harvest of NRF habitat is inevitable in all alternatives, including the No-Action Alternative. Federal "standards" for NRF habitat are not explicit and have not been used as a standard for regulatory purposes since the owl was listed in 1990. NRF definitions are based on documented use in the Planning Area through a variety of forest conditions. Growth of NRF habitat was based on standard growth-and-yield models as described in HCP Section 2.7. Assumptions for growth and maintenance of NRF habitat on Federal lands was based on assumptions under the Northwest Forest Plan with timber inventory data supplied by the Forest Service (HCP Section 2.6.5.2). Secondary habitat characteristics such as snags, downed logs, and other structural features are not presently detectable in timber inventories but often occur when inventory parameters of diameter, species, and density are met. The Mature Forest structural stage is defined separately from spotted owl NRF habitat. NRF habitat is defined in DEIS Section 2.4.1.2 and HCP Section 2.4. The definition of NRF is based on observations of owls and measurements of applicable habitat features. The probable location and distribution of NRF was displayed in HCP Figures 36 through 38 and discussed in HCP Section 3.5.1. Spotted owl sensitivity to forest fragmentation and patch size in the Planning Area was examined in the development of the RSPF model with a series of fragmentation indices (e.g., scaled dominance, fractal dimension) and no significant correlations between these indices and reproductive success were found (Irwin and Hicks 1995). An analysis of the RSPF model revealed that the model was in fact sensitive to changes in fragmentation and would predict lower occupancy rates on a fragmented landscape. The best available biological data on owl biology and observation evidence in the Planning Area suggests that "clustering" or concentrating habitat near active site centers would help ensure spotted owl occupancy (see HCP Section 3.2.1.1).

(8) Spotted Owl - FD habitat (quality/definition, amounts, distribution)

Comment Summary:
The Wenatchee National Forest, WDFW, Northwest Indian Fisheries Commission, Muckleshoot Indian Tribe, Yakama Indian Nation, National Audubon Society, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, two local organization, and 15 individuals commented on issues related to spotted owl foraging and dispersal habitat (FD). General comments included concerns that FD does not substitute for NRF habitat or old-growth, that owls would not use FD corridors but instead disperse across a large area, question the use of "small stepping stones," and the HCP should not infer that FD would

function on a landscape level. Comments relating to the amount of FD habitat provided by the HCP stated that insufficient FD is provided in RHAs, other areas, or above that required by current regulations (see HCP Tables 23 and 24). Comments relating to the definition included that the data and analysis used to define FD habitat is inadequate, not scientifically based, and is based on only data from two sites, the minimum tree size guidelines are too small, the application of the Murray Pacific model to the Planning Area should be validated, the definition is not based on FEMAT guidelines or includes data regarding owl prey or other characteristics needed by owls, provides no justification for its dispersal function to owls or other species, and questioned how "lift" would be provided for owl fly-through capability in FD stands. Other comments requested clarification as to why the Dispersal Forest structural stage is considered suitable for owls when only providing minimal conditions for owl roosting and foraging and why suitable habitat for owls is made up of younger forest stages in Table 3 of the Executive Summary version of the HCP. One commentor asked why dispersal habitat is so important in the HCP.

Services' Response:

Foraging/dispersal (FD) habitat is an often-cited but seldom-defined component of spotted owl habitat. FD habitat serves two very important functions. First, it meets some essential biological needs for food sources and thermal protection, particularly outside the nesting season by adults and juveniles; second, it connects areas of higher quality NRF habitat, increasing the effectiveness of small patches and reserve areas. FD habitat was not intended to "substitute" for NRF habitat but rather augment NRF habitat in the functions described above (see HCP Section 2.4). FD "corridors" are blocks of habitat linking riparian networks and upland habitat, not narrow linear bands of habitat surrounded by unsuitable areas. Radio-tracking of spotted owls in the Planning Area indicates that owls are adept at using landscape elements such as patches, riparian management zones, and narrow breaks in habitat to move considerable distances (see HCP Section 2.10.1.4). The "stepping stones" concept (i.e., use of 0.5 acre patches of superior FD or NRF habitat) was proposed by outside reviewers as a way to increase vegetative diversity for dispersal habitat; it is indicative of the type of landscapes (e.g., Green River) which were subjected to large-scale wildfires at the turn of the century, and yet, they still support owls because of residual "islands" of older forest interspersed in the second growth. Current regulations do not define or encourage the retention or growth of FD habitat. In fact, current regulations encourage the premature harvest of FD habitat before it becomes restricted NRF habitat. FD habitat in RHAs is intended to augment owl habitat in Forest Service Riparian Conservation Areas (RCAs), AMA's, and LSR's as well as the NRF habitat which would be maintained on the Applicant's ownership during the Permit period (see HCP Section 3.2.1.1 and Figure 33). The definition of FD habitat was derived from statistical analysis of forest conditions from nearly 1,000 vegetative plots around spotted owl telemetry locations. Therefore, FD habitat was based on actual use of this habitat by spotted owls in the Planning Area. Application of the Murray-Pacific dispersal habitat "model" to the Applicant's west side Cascades owl habitat was based on similarity of forest condition between the east and west side of the Planning Area; this definition has also been included in the proposed State owl rule. The definition of dispersal habitat used by FEMAT was general and lacked any quantitative measures. In their proposed AMA Plan, the Forest Service has used the "50-11-40" paradigm for dispersal and linkage habitat which is less rigorous than the Applicant's definition because the required canopy closure for FD habitat is higher both on the west and east sides of the Cascades (i.e., 70 percent and 55 percent, respectively). Recent monitoring of harvest treatments meeting FD characteristics have documented prey densities comparable to NRF habitat; more monitoring of this habitat type is proposed in the HCP (Section 5.2.3.) to verify small mammal responses to harvest prescriptions. Canopy "lift" or space between the canopy and understory shrubs is presumed to be a factor in spotted owl selection of foraging stands but has never been measured or verified by research. Canopy "lift" has not been a limiting

factor in forest stands in the Planning Area; it is accounted for in diameter and relative density descriptions for FD habitat. The term "suitable habitat" for spotted owls is used by the agencies to describe nesting habitat, but its use was avoided in the HCP to minimize confusion. FD habitat is not considered "suitable nesting habitat" for spotted owls, because it generally does not provide nesting opportunities. However, it is considered part of the "total" habitat available to spotted owls, especially to non-nesting adults and dispersing juveniles. Younger forest stages (e.g., Mature Forest and Dispersal Forest) are considered spotted owl habitat if they meet both quadratic mean diameter (QMD) and relative density (RD) criteria. Dispersal habitat is considered important in the HCP because it directly addresses the primary concern for habitat "connectivity" in the I-90 corridor and it is a habitat type which can be economically provided and maintained on commercial forest lands during the Permit period.

(9) General raptors

Comment Summary:

One individual commented that by reducing old-growth with implementation of the Plan, species such as raptors would suffer from reduced habitat.

Services' Response:

The majority of raptor species are included in Lifeforms 11, 12, and 14. These species tend to find primary nesting habitat in the later forest structural stages and generally forage in a variety of stages. Most species nest in trees using stick platforms although some use cavities in trees (e.g., the smaller owls). The later structural stages are expected to increase during the Permit period on the Applicant's lands as well as in the entire Planning Area (HCP Section 3.2.2) providing suitable habitat to sustain populations of these species. Green tree and snag retention measures in the HCP (Section 3.4.4), riparian area (Section 3.3) and spotted owl habitat management (Section 3.2.1.1), and growth and maintenance of later structural stages on Forest Service lands should provide habitat for cavity-nesting species. Ospreys typically nest near open water foraging areas. RHAs on the Applicant's lands along the shores of the large reservoirs in the Planning Area are expected to provide suitable nest trees. For additional information on specific raptors, see the Service's responses for Spotted Owl, Eagles, Peregrine Falcon, and Goshawk.

(10) Eagles

Comment Summary:

The Sierra Club-Cascade Checkerboard Project and one local organization commented that the impacts to bald eagles are not minimized or adequately addressed by the HCP, that the bald eagle should be included as a section 10 Permit species, habitat surrounding the large reservoirs in the Planning Area should be identified and protected, the effects of a resort in the Lower Cle Elum Valley would be significant on bald eagles, pole timber should not be considered as nesting or roosting habitat for either bald or golden eagles, and golden eagle impacts were inadequately addressed. Clarification was requested as to why the development of Bald Eagle Management Plans are a separate process from the HCP.

Services' Response:

Bald eagles were not included as a section 10 Permit Species in the HCP because the Applicant does not anticipate any "takings." Protection plans are developed as a separate process from the HCP since rules and protection guidelines have already been established by the State and which the Applicant would adhere to. Should bald eagle nests be identified on the Applicant's lands, a site-specific management plan would be developed in conjunction with State and Federal agencies to specify buffers, area closures, operational restrictions, and other measures to protect the eagle territory and nest productivity (see Washington Administrative Code 232-12-292). These management plans would also be developed for any bald eagle

nest sites identified outside of the Planning Area, such as in the Lower Cle Elum Valley. Bald eagle site-protection plans will not only include nest sites, but associated feeding sites and pilot trees. Winter concentration areas and communal roost sites will be protected from disturbances during the season of use. Impacts to bald and golden eagles were assessed by evaluating the availability of various structural stages during the Permit period in appropriate areas and occurrence of the eagles in the Planning Area. For the bald eagle, which may be expected to nest along the shores of the large reservoirs and rivers in the Planning Area, RHA guidelines for fish-bearing waters would provide trees in a 200-foot buffer along these waters for establishment of nests (see HCP Section 3.3). Once identified, the site-specific management plans would provide additional protection as appropriate. RHA guidelines would also protect habitat for fish resources, a principal forage base. Analysis of primary habitat for the bald eagle included an assessment of only dispersal forest through old-growth forest stages to reflect the availability of potential nest trees; pole timber stages were considered only as secondary habitat (see HCP Section 3.5.2.4). Pole timber stages were included in the primary habitat analysis for the golden eagle when these stages also contained substantial rock and talus, reflecting the availability of open, foraging habitat bordered by canopied forest. Nesting and foraging habitat for the golden eagle would be available during the Permit period, but impacts are anticipated to be minimal due to the species' limited range and distribution in the Planning Area.

(11) Peregrine Falcon

Comment Summary:

The Sierra Club-Cascade Checkerboard Project commented that the impacts analysis for peregrine falcons in the HCP is inadequate, the snag policy of the HCP may not meet the needs of peregrines, pesticide effects on peregrines and their prey items are not addressed in the HCP, and road construction effects on peregrines are not addressed. Clarification was requested as to why the development of site-specific management plans are a separate process from the HCP.

Services' Response:

Protection plans are developed as a separate process from the HCP since rules and protection guidelines have already been established by the State, and which the Applicant would adhere to. The Applicant does not anticipate any incidental take of peregrine falcons. The Applicant will follow protocol surveys before conducting harvest or road building near likely eryie sites. Should peregrine falcon nests be identified on the Applicant's lands, a site-specific management plan would be developed in conjunction with State and Federal agencies to specify buffers, area closures, operational restrictions, and other measures to protect the falcon territory and nest productivity (see Pacific States Peregrine Falcon Recovery Plan). As part of this Plan, appropriate snags would be retained in proximity to the nest site to serve as perch sites surrounding the eyrie. Snags would be available in the landscape from snag and green tree retention measures developed by the Applicant in discussion with the Services (see HCP Section 3.4.4 and the Response to Snag Concentrations). Pesticides are not currently used by the Applicant and effects on peregrine prey items in the Planning Area, though not quantified, are expected to be minimal (see HCP Section 1.2.3.3 for an explanation of the Applicant's Standard Practices regarding herbicide and pesticide use). Road construction is typically avoided in cliff, rock, and talus areas due to the steep terrain and construction difficulty, and therefore is expected to have minimal impacts to nesting areas. Roads would not be constructed in large open wetlands or adjacent to lakes, reservoirs, or rivers that may be foraging areas for peregrines.

(12) Goshawks

Comment Summary:

The Yakama Indian Nation, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project,

two local organizations, and 12 individuals commented on issues regarding the northern goshawk. Most comments stated that insufficient protection is provided for goshawks in the HCP, deferral areas are too small and inadequate, and that impacts to goshawks were underestimated or unknown in the HCP and no incidental take permit should be granted until additional documentation is provided. Other comments acknowledged the deferrals and urged that a 30-acre, no-entry area be provided year-round around all active sites discovered.

Services' Response:
Protection measures in the HCP for goshawks include harvest deferrals surrounding all known currently active nest sites on the Applicant's lands in the Planning Area. Habitat management directed toward the spotted owl would provide nesting and foraging habitat for goshawks, and seasonal restrictions regarding operations surrounding nest sites discovered in the future would also protect a goshawk nest stand and nest productivity (HCP Section 3.5.2.4). These measures exceed State Forest Practices Rules and Regulations regarding goshawks (there are currently no State regulations protecting goshawks) and have been determined by the Services as appropriate mitigation to address impacts to goshawks from the Applicant's activities. Goshawks use a variety of structural stages for foraging and nesting which would be available in amounts and distribution during the Permit period so that no adverse impacts to goshawk populations are expected.

(13) Woodpeckers

Comment Summary:
The Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, and four individuals commented on issues regarding woodpeckers. These comments included that habitat needs (e.g., snags) for white-headed and Lewis' woodpeckers are not adequately addressed in the HCP, data to base impacts analysis for these species are not provided in the HCP, and differences in range and habitat use between the species are not addressed in the habitat analyses. Commentors noted that if adequate habitat is not provided for woodpeckers, they would go extinct or that by reducing old-growth with implementation of the Plan, woodpeckers would suffer from reduced habitat. One commentor noted that she had seen hairy woodpeckers near the West Fork Teanaway River. Comments specific to the pileated woodpecker suggested that snag retention measures for pileated woodpeckers are insufficient and impacts from the HCP were not adequately addressed.

Services' Response:
Snags for woodpecker use would be available in the landscape based on snag and green tree retention measures developed by the Applicant in discussion with the Services and WDFW (see HCP Section 3.4.4 and the Services' response to Snag Concentrations). In response to concerns identified by the Services, WDFW, and public comments regarding impacts to wildlife species associated with Ponderosa pine forest types, the Applicant further analyzed forest classes in the Planning Area. Ponderosa pine/Lodgepole pine (PP-LP) structural stage trends were identified during the Permit period. This data shows that of the 4.1 percent of the Planning Area in the PP-LP forest class, amounts of later structural stages, except for the mature forest stage (OG, MOG, DF), increase during the Permit period (see FEIS Appendix 4, Section 3.5.3, Table 30b). Adverse impacts to white-headed and Lewis' woodpecker populations are not expected based on this data, snag retention measures in the HCP, and the species' range and distribution in the Planning Area. Additional clarification of harvest methods in Ponderosa pine stands has been included in the HCP (see FEIS Appendix 4, Section 3.4.6). Old-growth habitat would not be effectively reduced in the Planning Area (see HCP Table 30) and should continue to provide a variety of habitat niches for

different woodpecker species. Differences in habitat use by several woodpecker species was recognized by HCP habitat analyses by separating Lifeform 13 into two subgroups based on species' habitat use and snag requirements (see HCP Section 3.5.3.13). This was a result of peer review comments of HCP Technical Reports and discussions within the Services. In addition, consideration of the impacts to pileated, white-headed, and Lewis' woodpeckers were discussed separately for each species by including them as Species of Concern (see HCP Section 3.5.2.4). Analysis of habitat trends during the Permit period for subgroup 13a suggest that growth of habitat on Federal lands, management for spotted owl habitat on the Applicant's lands in harvest deferrals, RHAs, and snag retention measures would provide adequate habitat for populations of these species.

(14) Vaux's swift

Comment Summary:

The WDFW, Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, and two individuals commented on the Vaux's swift. Comments included that snags with documented use by this species should be protected, the HCP provides inadequate habitat analysis, does not provide enough snags, or impacts are not adequately addressed. Old-growth was noted as being important for this species. Clarification was requested as to whether dispersal and mature forest should be included in suitable habitat, if these forest stages would contain enough large trees, and what percentage of each structural stage (MF, MOG, OG) comprises available primary habitat.

Services' Response:

Based on discussions within the Services and WDFW, and in response to public comments, the Applicant has provided additional habitat protection in the HCP specifically directed toward Vaux's swifts, fishers, and martens. Hollow snags, identified during harvest layout and design, would receive priority for retention consistent with State worker safety rules. Hollow snags provide nest sites for Vaux's swifts and roosting sites for bats. Adverse impacts to Vaux's swifts as a result of the Applicant's activities would be mitigated in part by HCP measures directed toward management of habitat for the spotted owl. Harvest deferrals, maintenance of FD habitat in RHAs, and protection of open wetlands through buffers greater than current State Forest Practices Rules and Regulations would provide nesting and foraging habitat for this species. Old-growth habitat would not be effectively reduced in the Planning Area (see HCP Table 30) and should continue to provide a variety of habitat niches for Vaux's swifts. Dispersal and mature forest structural stages contain snags suitable for Vaux's swifts to some degree; mature forest was included in consideration of primary habitat and dispersal forest was included in only secondary habitat analyses. Management for higher relative densities in dispersal forest stands would provide for a larger diversity of trees in terms of size, age, and species, and tree mortality and snag densities would be more prevalent. Table 30 in the HCP provides a breakdown of the entire Planning Area, by ownership, in regard to trends in amounts of forest structural stages during the Permit period. A slight decrease is expected in mature forest and managed old-growth stages and a slight increase in old-growth for the entire Planning Area. However, the number and distribution of snags rather than amounts of structural stages may be a more appropriate indicator of suitable habitat for this species, and as discussed above, are expected to be available to sustain populations of this species.

(15) Band-tailed pigeon

Comment Summary:

The WDFW recommended that the HCP include provisions for protecting mineral springs for band-tailed pigeons with a forested buffer when identified in low elevation forests.

Services' Response:
In response to discussions with the Services, WDFW, and public comments received, the Applicant has provided additional protection of seeps and springs, in particular, mineral springs, identified as a Special Habitat important to band-tailed pigeons (see FEIS Appendix 4, Section 3.4.5). Activities within 200-feet of mineral springs would be coordinated with the Services and designed to retain adequate trees for perching, and to maintain berry, fruit, and mast-producing shrubs and trees. In addition, harvest operations would be restricted in this habitat, and a buffer retained. The Applicant will take measures to avoid excessive use of herbicides.

(16) Other bird species

Comment Summary:
Two individuals commented on issues regarding other bird species. One commentor noted that she had seen blue grouse and varied thrush near the West Fork Teanaway River. Another commentor noted that by reducing old-growth with implementation of the HCP, numerous songbirds would suffer from reduced habitat and that 30 percent to 45 percent of west side forest birds use snag cavities as nesting sites.
Services' Response:
Observations of bird species have been noted. Old-growth habitat would not be effectively reduced in the Planning Area (see HCP Table 30) and should continue to provide a variety of habitat niches for songbirds that use this forest type. Songbirds is a generic term for an assemblage of bird species that use a wide variety of habitats. The HCP grouped individual species into Lifeforms based on similar habitat use or association with structural stages and analyzed impacts to each Lifeform separately (see HCP Section 3.5.3). Results indicate that habitat would be available to sustain populations of songbirds, although habitat for some species may decline during the Permit period, particularly for those species associated with earlier forest structural stages (e.g., Lifeform 6). Songbird species in this group may not be as impacted as the habitat analysis suggests, possibly due to the Applicant's analysis of habitat only within RHAs for this Lifeform and the probable use of available habitat outside RHAs by these species (see HCP Section 3.5.3.6 and FEIS Appendix 4, Section 3.5.3.6). Bird use of snags in west side forests has been addressed in the HCP by including measures to retain snags and green trees in harvest units and analysis of structural stages and habitat for Special Emphasis Species, Species of Concern, and Associated Species. See also the response to Snag Concentration.

(17) Neotropical migrants

Comment Summary:
The Wenatchee National Forest, Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, and Wilderness Society commented on issues regarding neotropical birds. These comments included that the HCP should consider the occurrence of neotropical migratory bird species in the impacts analysis and that some neotropical bird species require a more closed canopy dispersal forest than that provided in the HCP. Species-specific comments for the little willow flycatcher included that the HCP provides inadequate habitat analyses by including RHAs but not intermittent streams in the analysis and excluding Plum Creek's low elevation forests to the west of the HCP boundary. Inadequate habitat analyses was also noted for the western bluebird since not enough available habitat data regarding the acreage of Ponderosa Pine forest was provided and lowland areas were excluded from the HCP boundary. Comments on the olive-sided flycatcher suggested that more clearcutting in mid- to upper-elevations, where fewer fish-bearing streams occur, would impact this portion of their range. One commentor stated that the habitat model for the olive-sided flycatcher is incorrect by including pole timber since this stage would not contain adequate snags due to past harvest practices.

Services' Response:
The HCP considered the occurrence of neotropical migrant birds through guilding species into Lifeforms (see HCP Section 3.5.3), analyzing habitat trends during the Permit period for each Lifeform, and discussing the impacts to each Lifeform, or some cases individual species, from the Applicant's activities and how measures in the HCP may mitigate or minimize impacts. Dispersal Forest would be managed to provide a canopy closure of 70 percent (HCP Section 2.3). Exact species-specific requirements for canopy closure are inconclusive for most species, however, a variety of structural stages providing dense canopy cover would be available in the Planning Area in harvest deferrals, spotted owl NRF habitat, and habitat on Federal lands. Intermittent streams were excluded from habitat analyses for the little willow flycatcher since these areas could not be spatially analyzed and management of these areas would be variable based on watershed analysis prescriptions and site-specific harvest designs. Habitat analyses for all species were restricted to the HCP boundaries to assess only impacts from the Applicant's activities within this area. In response to concerns identified by the Services and public comments regarding impacts to wildlife species associated with Ponderosa pine forest types, the Applicant further analyzed forest classes in the Planning Area. Ponderosa pine/Lodgepole pine (PP-LP) structural stage trends were identified during the Permit period (see FEIS Appendix 4, Section 3.5.3, Table 30b). Adverse impacts to western bluebird populations are not expected based on this data, snag retention measures in the HCP, and the species' range and distribution in the Planning Area. Additional clarification of harvest methods in Ponderosa pine stands has been included in the HCP (see FEIS Appendix 4, Section 3.4.6). Foraging and nesting habitat for olive-sided flycatchers would be available in mid- to upper-elevations on Federal lands (e.g., LSRs, AMAs, and RCAs) and would occur on the Applicant's lands in the form of shrub/sapling, young forest, and pole timber stages. Though olive-sided flycatchers construct a platform nest typically in live conifers, they use tall snags as perch sites from which to "sally" and forage. Snag retention measures in the HCP are expected to provide adequate snags in these younger structural stages to serve as foraging areas for the olive-sided flycatcher.

c. Reptiles - turtles

Comment Summary:
The WDFW, Sierra Club-Cascade Checkerboard Project, and one individual commented on issues regarding turtles. Comments specific to the western pond turtle recommended that surveys and adjustments to location, timing, and method of operations within at least 400-meters of inhabited waters be developed and that the HCP left out potential habitat on Plum Creek lands in eastern King County. The WDFW suggested avoidance of all take was necessary to adequately address pond turtles, and later, gave conflicting advice regarding turtles' ability to benefit from sun exposure in early seral stages. One commentor noted that by reducing old-growth with implementation of the Plan, turtles would suffer from reduced habitat.

Services' Response:
No impact to western pond turtles is anticipated because this species, due to its affinity for lower elevations or coastal wetland ponds or sloughs, is unlikely to occur in the Planning Area. However, habitat for this species would be maintained and protected by creating RHA's adjacent to fish-bearing waters and increasing protection surrounding open water wetlands above State Forest Practices Rules and Regulations (see FEIS Appendix 4, Section 3.4.1). Water quality would also be maintained or improved based on watershed analysis and RHA establishment. Changes in the amount of old-growth in the Planning Area should not correlate to impacts on turtles because of their principal use of special aquatic habitats. RHAs

would maintain a canopied forest surrounding these aquatic habitats which would provide shading, course woody debris, leaf litter, nutrients, and other elements important to turtles. Protection of listed turtle species outside of the Planning Area by the Applicant would be governed by the ESA and State Forest Practices Rules and Regulations.

d. Amphibians - frogs and salamanders

Comment Summary:

The Wenatchee National Forest, WDFW, Northwest Indian Fisheries Commission, Yakama Indian Nation, Wilderness Society, Sierra Club-Cascade Checkerboard Project, one local organization, and seven individuals commented that the HCP does not provide adequate habitat for amphibian species, and that species such as Cascade frogs, Larch Mountain salamanders, and tailed frogs need more protection. The Wilderness Society commented that the HCP needs to provide better dispersal habitat for amphibians and more forest protection. The Sierra Club-Cascade Checkerboard Project and WDFW commented that use of ground-based equipment near Type 4 and 5 streams would impact tailed frogs; that tailed and Cascades frogs use intermittent streams, and that Larch Mountain salamander is inadequately addressed. The Northwest Indian Fisheries Commission suggested that all forest canopy within 100-feet of a talus slope should be retained to protect Larch Mountain salamanders. One individual suggested that removal of the forest canopy would expose amphibians to UV radiation. One individual commented that old-growth forest declines predicted in the spotted owl strategy would reduce salamander and frog habitat. One individual suggested that a 300-foot, no-cut buffer is needed to protect amphibians.

Services' Response:

Adverse impacts to amphibian populations in the Planning Area are not predicted for the Cascade frog and other amphibians based on data compilation and synthesis, habitat modeling, and peer review of the species/habitat matrix. Impacts to amphibians were discussed as individual species (HCP Section 3.5.2) or included in Lifeform analysis (HCP Section 3.5.3). RHA and RLTA design would protect habitat for amphibians. Amphibian surveys would be conducted over two periods of three to five years each, with data provided for the second (2001) and fourth (2011) reports which would evaluate the effectiveness of RHA and RLTA prescriptions (see HCP Section 5.2.2). Results of recent research on amphibian habitat preferences in the Planning Area suggest that nonbreeding habitat in Type 5 intermittent streams is characterized by inner gorges, a feature identified and protected in watershed analysis (see also response to Ephemeral/Intermittent Streams). Based on discussions with the Services and public comments, additional clarification regarding wetland protection has been added to the HCP (see FEIS, Appendix 4, Section 3.4.1). Protection buffers surrounding wetlands, including equipment exclusion areas, would benefit wetland-dependent species such as amphibians. Additional protection along Type 4 streams has been added to the HCP to include a 30-foot, ground-based equipment exclusion zone and extension of the RHAs on the east side of the Cascade crest where bull trout, anadromous fish, or 303(d) listed waters are a concern (FEIS, Appendix 4, Section 3.3.3.1). Larch Mountain salamanders are thought to be associated with talus habitats and have been addressed in the HCP by special management of talus slopes (see HCP Section 3.4.2). Additional language has been added to the HCP by the Applicant to focus tree retention around talus slopes to maintain shading and provide a source of coarse woody debris (see Changes to the DEIS, Section 2.5.2).

e. Fish

Comment Summary:

The Northwest Indian Fisheries Commission, Muckleshoot Indian Tribe, and Tulalip Tribes suggested that Plum Creek should conduct fish population surveys in each watershed, and that Plum Creek should locate

and type streams in the Planning Area, and identify and remove barriers to fish migration. The Defenders of Wildlife commented that Plum Creek's emphasis on fish-bearing streams is appropriate, but they would like to see larger buffers on salmon and other fish-bearing streams, and protection of all tributary streams. The Sierra Club-Cascade Checkerboard Project commented that the HCP does not provide a high enough level of protection and certainty for fish. The Yakima Basin Joint Board disagreed that Plum Creek's "Limiting Factors Analysis" adequately documents "cause and effects" relationships of factors affecting salmonid fish. Comments from 424 preprinted cards and a number of other individuals suggested that reducing road mileage would protect salmon and trout. Three individuals commented that continued clearcutting and road building would affect fish. Three other individuals suggested that Plum Creek should protect fish runs with wider no-cut zones. One individual felt that the Cle Elum River is important to fish habitat. One individual commented that Plum Creek should protect fish by not allowing activities that encroach on streams and rivers. One individual suggested that Plum Creek should predict stream flow requirements for upstream and downstream passage of salmonids. Another individual suggested that the HCP creates an implicit incentive for loss of fish runs by not specifying what would happen if a fish-bearing stream no longer had fish. One individual (on a preprinted card) suggested that fisheries should be maintained on a self-sustaining (wild) basis, if practicable.

Services' Response:
The effects of the Riparian Management Strategy are detailed in HCP Section 3.3.3.1 and the effects on fish habitat are outlined in HCP Section 3.3.3.2. The Services believe the 200-foot RHA strategy is scientifically justified and would provide the full range of riparian functions necessary for maintaining and protecting aquatic resources. The Applicant has also added 100-foot RHAs on Type 4 streams in watersheds with anadromous fish or bull trout east of the Cascade crest and prohibited ground-based equipment within 30-feet of these streams. The effectiveness of RHAs proposed by the Applicant would be evaluated in watershed analysis and subsequent monitoring and/or review by the Services (Sections 3.3.5 and 5.1.6). Allowing some harvest in RHAs would actually accelerate restoration by increasing the growth of riparian trees. Riparian areas within 200-feet of fish-bearing streams have already been identified as sensitive and only limited road construction and no even-aged harvesting would be allowed within these areas. The proposed stream protection guidelines would apply to the Cle Elum River. The HCP does not promote or create an incentive to reduce the distribution of fish. On the contrary, the Services anticipate an increase in fish distribution as road improvements, including repair of culverts that block passage, and habitat conditions improve with the implementation of the HCP. Forestry typically has little effect on instream flows and if anything increases those flows. Minimum instream flow requirements are more applicable for landowners that withdraw water from streams. The HCP through watershed analysis would address areas where excessive sedimentation of streams could reduce the amount of instream surface water flow. The Limiting Factors Analysis was not meant to document all cause and effect relationships in detail. The document generally describes some of the more obvious and prevalent factors that have affected salmonids regionally and within the Planning Area. The Applicant has committed to fish population surveys as described in Sections 3.3.5 and 5.1.6. In addition, the Applicant would verify the presence or absence of fish in suitable small streams (i.e., Type 4 streams near the confluence of Type 3 streams). The Services believe riparian and aquatic habitats provided under the Proposed Plan will be substantially better than under the No-Action Alternative and, therefore, the associated fish species will benefit as well. Activities by the Applicant in the Proposed Plan would allow fisheries to be maintained on a self-sustaining basis.

(1) Anadromous salmonids - general

Comment Summary:
The WDFW and one individual commented that the effects of the riparian strategy on anadromous salmon and steelhead trout was not adequately quantified in the HCP. The Muckleshoot Indian Tribe suggested that the HCP should clarify salmonid productivity number in the Green River (HCP Section 2.12) and note that the 107 miles of anadromous habitat available was estimated from the WRIA. The Puyallup Tribe of Indians recommended that instream flow estimates, that maximize habitat for wild salmonids should be established for all streams in the Planning Area. The Defenders of Wildlife, North Cascades Conservation Council, Sierra Club-Cascade Checkerboard Project, Northwest Ecosystem alliance, one local organization, and 10 individuals commented that the HCP should incorporate larger, no-cut buffers similar to the 300-foot, no-cut buffers on Federal lands, to protect salmon streams. Two local organizations and 24 individuals commented that the HCP must reduce road mileage in the Planning Area to protect salmonid habitat. One local organization and seven individuals commented that road construction and clearcutting would need to be reduced to prevent negative impacts on salmon habitat. Four individuals commented that maintaining old-growth forests in roadless areas is the only proven safeguard for continued health of salmon. One individual suggested the HCP underestimated the harm that the Plan would do salmon habitat. Another individual commented that the HCP needs to ensure consistent protection of habitat throughout the watershed to protect upstream and downstream salmon habitat.

Services' Response:
The effects of the Riparian Management Strategy are detailed in HCP Section 3.3.3.1 and the effects on fish habitat are outlined in HCP Section 3.3.3.2. The Services believe the 200-foot RHA strategy is scientifically justified and would provide all the important habitat elements necessary for maintaining and protecting aquatic resources. Reduction of sediment into streams from roads has been and would continue to be a primary objective of the Applicant's watershed and forest management activities. Rather than simply reducing road mileage blindly, the HCP would be used as a tool to identify the most difficult road-related problems in the watersheds and allow the Applicant to employ a number of strategies to address the roads. In many cases, this would translate into abandonment and closure of some roads and an overall reduction in road mileage (Sections 1.2.3.4 and 3.6.9). Use of silvicultural techniques within the RHAs would also help speed the recovery of many riparian and aquatic habitat areas, at least in part by encouraging growth of large conifers. Watershed analysis would help to identify sensitive areas where road construction and even-age harvesting have the potential to cause negative impacts on aquatic habitat. Riparian areas within 200 feet of fish-bearing streams have already been identified as sensitive and only limited road construction and no even-age harvesting would be allowed within these areas. The Services believe that the HCP is a safeguard for the continued health of salmon by employing the latest scientific information and an adaptive management strategy that includes monitoring to ensure that the HCP guidelines are effective. The Services believe the riparian prescriptions associated with this HCP in addition to the Federal land management strategy of riparian reserves on Forest Service land would combine as an effective habitat base for anadromous and resident fish. The Services also believe the HCP would help to improve salmon and resident fish habitat in both the short- and long-term. The Applicant has added 100-foot RHAs on Type 4 streams in watersheds with anadromous fish or bull trout east of the Cascade crest and prohibited ground-based equipment within 30 feet of these streams. The Applicant's protection of perennial, nonfish-bearing streams (Type 4) and use of watershed analysis to identify sensitive areas on hillslopes that feed into all streams is evidence of consistent protection of upstream and downstream salmon and resident fish habitat. The 107 miles of anadromous habitat is estimated from the

Washington Rivers Information System managed by the Department of Fish and Wildlife. Forestry typically has little effect on minimum instream flows and if anything increases those flows. Minimum instream flow requirements are more applicable for landowners that withdraw water from streams. The HCP through watershed analysis would address areas where excessive sedimentation of streams could reduce the amount of instream surface water flow.

(2) Anadromous salmonids - steelhead

Comment Summary:
The Sierra Club-Cascade Checkerboard Project noted that the effects of roads and yarding corridors are not quantified in the HCP, older forest stands would be needed for stream shading and course woody debris input, and with road construction and logging in unroaded areas, there may be a net decrease in overall stream habitat quality..

Services' Response:
See the Responses for Fish, Anadromous salmonids - general, Stream Shading, and Large Woody Debris.

(3) Anadromous salmonids - coho

Comment Summary:
One individual commented that intermittent streams need protection because coho fingerlings use off-channel areas during high flow months, when mainstem velocities are greater than the fish can withstand.

Services' Response:
Intermittent streams that coho fingerlings would use during high flows typically occur on the floodplain areas of larger streams. These floodplain areas would have minimum 200-foot Riparian Habitat Areas (RHAs). Upon completion of watershed analysis, these streams may require wider riparian zones, depending on the valley morphology, flooding frequency, and ability of the channel to migrate.

(4) Anadromous salmonids - chinook

Comment Summary:
The Muckleshoot Indian Tribe commented that contrary to the mapping depicted in HCP Figure 28, spring chinook historically spawned in the upper Green River watershed.

Services' Response:
Figure 28 has only current native stock distribution mapped. According to Grette and Salo (1986), it is unknown whether spring chinook historically utilized the upper Green River watershed, although it is likely.

(5) Anadromous salmonids - chum

Comment Summary:
One individual commented that intermittent streams need protection because chum salmon actually use the stream flood bank overflow area as a spawning ground.

Services' Response:
No chum salmon currently exist or historically existed within the Planning Area. Areas that have the

potential for overbank flooding would have retention of riparian vegetation. Intermittent streams that enter into these floodplain areas would also have this same protection.

(6) Anadromous salmonids - freshwater issues

Comment Summary:
The Northwest Indian Fisheries Commission and Puyallup Tribe of Indians suggest that land management impacts and logging, roading, and changes in channel morphology contributed to fish stock declines between 1941 and 1980. One individual commented that past practices, such as logging close to stream beds has caused the salmon to become an endangered species. One individual commented that if logging had been done with protection of fish habitat the last 100 years, there would be no salmon crisis today.

Services' Response:
The Services agree that timber harvesting and road building contributed to fish habitat degradation, but within the Planning Area these effects are minor compared to the loss of habitat due to human influence prior to 1940. The greatest impacts during the pre-1940 period were from dams on the mainstem Yakima and Green Rivers, water diversions that blocked fish passage on most of the main tributaries, and commercial harvest of fish. Timber harvesting is one factor of many that have diminished the quantity and quality of fish habitat. Other factors include water withdrawals, agriculture, and urbanization. It is simplistic to think that forest practices are the sole cause of the present salmon crisis. In addition to the factors listed that have impacted fish habitat, the three major factors that led to the current salmon crisis are dams that prevented salmon from accessing hundreds of stream miles; over-harvest of fish by commercial and sports fishermen; and dependence on hatcheries to supplement declining stocks of fish.

(7) Resident salmonids - bull trout

Comment Summary:
The Muckleshoot Indian Tribe suggested that bull trout surveys should be conducted at night. The Northwest Indian Fisheries Commission and seven individuals commented that the HCP should include 300-foot, no-cut buffers for fish-bearing streams and 150-foot buffers for nonfish-bearing streams. The Northwest Ecosystem Alliance suggested that there is insufficient habitat in the Planning Area for bull trout, and the Sierra Club-Cascade Checkerboard Project was concerned about what Plum Creek would do if bull trout were found in the Green River. One local group and eight individuals commented that more protection from clearcutting and road construction is needed in roadless and old-growth areas to protect bull trout habitat. One local group and one individual commented that a full assessment is needed to address the bull trout survival question.

Services' Response:
The effects of the Riparian Management Strategy are detailed in HCP Section 3.3.3.1 and the effects on fish habitat are outlined in HCP Section 3.3.3.2. The Services believe the 200-foot RHA strategy is scientifically justified and would provide all the important habitat elements necessary for protecting bull trout. Watersheds with bull trout receive 100-foot RHAs and the Applicant has added a prohibition on ground-based equipment within 30-feet of these streams. The effectiveness of RHAs proposed by the Applicant would be evaluated in watershed analysis and subsequent monitoring and/or review by the Services (Sections 3.3.5 and 5.1.6). The Applicant has conducted numerous surveys for bull trout and has included monitoring elements specifically directed at bull trout (Section 5.1.6). The HCP protects

aquatic habitat throughout the entire Planning Area, so finding bull trout in the Green River would not affect its implementation. Any bull trout population surveys would utilize night snorkeling techniques, but for presence/absence work, daytime snorkeling and electrofishing are considered adequate for this HCP. The Services note that the presence or absence of bull trout has only minimal implications under the Proposed Plan as it would be implemented on this landscape.

(8) Resident fish - other

Comment Summary:
The Sierra Club-Cascade Checkerboard Project and a local organization commented that the HCP does not discuss nonsalmonid resident fish species.

Services' Response:
The HCP document does mention a number of resident fish including bull trout, mountain whitefish, rainbow, sculpin, cutthroat, brook, lake, and brown trout (Sections 2.13, 2.10.5.2; 3.2.2.1). Discussion of resident and non-salmonid fish such as sculpin is limited because typically less information exists on their distribution, life histories, and specific habitat requirements. A primary assumption of the Riparian Management Strategy proposed by the Applicant is that by addressing the biological needs of the most sensitive fish species (e.g., salmon and bull trout), the needs of other fish species in the Planning Area would be met. This strategy provides equally strong protection for all species because of the emphasis on maintaining natural habitat conditions throughout the fish-bearing stream network (Section 3.3.3.2). The Services note that readers interested in seeing such a list could consult the SPAMA Plan DEIS (1995).

f. Invertebrates - mollusks

Comment Summary:
The Wenatchee National Forest, Sierra Club-Cascade Checkerboard Project, and one individual commented on invertebrate wildlife issues. Comments included that the HCP should address the indirect effects of the Proposed Action on late-successional associated invertebrate species such as mollusks, asked if the HCP adequately protects invertebrates and their habitat, and stated that the myriad of invertebrates are the result of the large food base and diverse habitats provided by a well-aged forest.

Services' Response:
This HCP addresses only vertebrate species. Measures in the HCP that protect riparian areas and wetlands, provide habitat for the spotted owl, protect Special Habitats (e.g., caves, talus slopes, green tree and snag retention), and harvest deferrals would provide habitats suitable for a variety of invertebrate species. The biological opinion conducted under section 7 of the ESA regarding the Northwest Forest Plan assumed a worst-case scenario for the intermingled and adjacent nonfederal lands. It was assumed that those lands would be heavily harvested; however, harvest protections in place for owls would not be completely alleviated. The viability assessments referred to in the comment (FEMAT and SAT) made similar assumptions in their viability analyses. The Recovery Plan and the proposed 4(d) Special Rule for spotted owls discussed goals for private lands in this particular landscape which include both dispersal and demographic support. The Preferred Alternative provides for both of those functions, other alternatives may or may not. Differences in the alternatives as they pertain to invertebrates are few and minor. An analysis has been appended in Section 4.7.4. Mollusks are addressed through water quality and riparian habitat. The largest threat for mollusks is likely water diversion, which is not part of this action.

g. Other categories

(1) Detritivore community

Comment Summary:
One individual commented that the detritivore community needs well-aged forests for survival and that clearcutting causes the loss of soil nutrients and organic matter which results in the loss of soil flora and fauna.

Services' Response:
The Applicant's harvest methods, snag and green tree retention measures, and adoption of State Forest Practices Rules and Regulations would maintain elements that enhance the protection of detritivore communities in harvest units. Specifically, the Applicant's use of shelterwood, overstory removal, and selective harvesting would maintain canopy cover that would provide shade and other microclimatic conditions needed by detritivores (see HCP Section 1.2.3.1). RHAs, RLTAs, and snag and green tree retention measures would also provide source populations for dispersal of these species. The Applicant's timber-falling contractors are required to refrain from causing soil erosion or degradation of side slopes and watershed analysis would also provide prescriptions to prevent soil erosion in sensitive areas. Concerns that clearcutting and slash burning impact nutrient cycling is not consistent with research that has documented a flush of soil nutrients immediately following timber harvest and opening of the forest canopy (e.g., the Asart Effect).

(2) Low-mobility species

Comment Summary:
One individual commented that conversion of diverse native forests to managed younger forests under the HCP would create severe difficulties for non-vagile species that are already seeing habitat disruptions due to development, logging roads, and the interstate highway.

Services' Response:
Measures in the HCP that protect Special Habitats (e.g., riparian zones, wetlands, caves, talus slopes) and maintain spotted owl habitat would protect a variety of habitats inhabited by low-mobility species. These measures would avoid or minimize impacts to these species at those sites. In some cases, local impacts may occur based on landscape conditions, however, populations are expected to persist across the Planning Area due to management of Federal lands and habitat protection on the Applicant's lands. The old-growth stage changes little in amount so most would remain as refugia. See also the Responses for Patch Size and Connectivity.

(3) Listed species

Comment Summary:
The Northwest Ecosystem Alliance and three individuals (one comment on a preprinted card) commented on issues related to federally listed species. Comments included that the HCP does not provide adequate protection for threatened and endangered species and urged protection of productive nest sites of listed and candidate species.

Services' Response:
Measures in the HCP to protect threatened and endangered species must be determined by the Services to result in no jeopardy to populations of these species. This would be based on review of the HCP and analysis of likely impacts to listed species from the Applicant's activities by Services' biologists. The HCP does afford nest site protection for specific listed and candidate species: (1) spotted owl deferrals for 20 years surrounding 30 selected productive nest sites; (2) goshawk deferrals for 20 or more years surrounding five identified nest sites; (3) bald eagle and peregrine falcon nest sites management plans should these species be documented; and (4) marbled murrelet and gray wolf breeding sites.

(4) Species of concern

Comment Summary:
The Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, and one individual commented on general issues regarding "Species of Concern." Comments included that there is a gap in habitat protection for species in pine and pine/fir forests; exclusion of low elevation Plum Creek lands limits or avoids a discussion of management impacts on habitat for key species; analysis and protection is inadequate; especially for species that require large snags and trees; urged that no more clearcutting take place in designated areas known to have protected species; and surveys should be conducted to confirm the occurrence and abundance of species in the "Special Emphasis" group.

Services' Response:
Based on discussions within the Services, with the WDFW, and public comments, additional analysis and data has been included in the HCP which describes trends in Ponderosa pine/Lodgepole pine (PP-LP) forest structural stages through the Permit period (see FEIS, Appendix 4, Section 3.5.3, Table 30b). Results of the analyses suggest that of the 4.1 percent of the Planning Area in the PP-LP forest class, the acreage of later structural stages, except for the Mature Forest stage, would increase during the Permit period benefiting species associated with later stages (see Responses to Woodpeckers and Neotropical Migrants). Measures in the HCP to provide large snags and trees for Species of Concern and emphasis on retention of hollow snags for Vaux's swifts, woodpecker species, and flammulated owls have been deemed adequate by the Services for inclusion of these species in the Unlisted Species Agreement (see HCP Section 3.4.4 and FEIS, Appendix 4, Section 3.4.4). Protection of listed species outside of the Planning Area by the Applicant would be governed by the ESA and State Forest Practices Rules and Regulations.

(5) Aquatic organisms

Comment Summary:
The WDFW commented that the HCP may not provide for the needs of all riparian and wetland species by relying solely on watershed analysis to devise protection schemes. The Yakama Indian Nation questioned whether the HCP provides enough protection to maintain and recover aquatic species.

Services' Response:
Watershed analysis is not used in the HCP by the Applicant to address the needs of all riparian and wetland species. The focus of the State watershed analysis process is on fish and water quality. Watershed analysis, however, would benefit other aquatic organisms indirectly through resultant measures that maintain or restore water quality, protect inner gorges and other sensitive areas from mass-wasting and soil erosion, and prescribe buffer treatments. The needs of riparian and wetland-associated species have been provided for in the HCP by the Applicant through the Riparian Management Strategy (HCP Section

3.3). Based on discussions within the Services, with the WDFW, and public comments, additional clarification regarding wetland protection has been added to the HCP (see FEIS, Appendix 4, Section 3.4.1). Protection buffers and equipment exclusion zones surrounding wetlands and Type 4 streams would benefit wetland-dependent species such as amphibians (see responses to Wetlands, Amphibians, Ephemeral/Intermittent Streams).

(6) Aquatic invertebrates

Comment Summary:
The Puyallup Tribe of Indians and one individual commented on issues regarding aquatic invertebrates. One commentor requested clarification if the HCP includes aquatic invertebrates in its scope (for fish survival) and one commentor suggested that aquatic invertebrate sampling be done during winter for enhanced detection of changes in community composition and that an experienced entomologist review the sampling design.

Services' Response:
A primary assumption of the Applicant's Riparian Management Strategy (HCP Section 3.3) is that by addressing the biological needs of the most sensitive fish species (e.g., salmon and bull trout), the needs of other aquatic species in the Planning Area would be met. This strategy provides equally strong protection for all species of fish because of the emphasis on maintaining natural habitat conditions throughout the fish-bearing stream network (Section 3.3.3.2). The Applicant's monitoring design was reviewed by an aquatic entomologist and the Applicant would continue to consult experts as sampling designs are refined.

(7) Terrestrial organisms

Comment Summary:
The Sierra Club-Cascade Checkerboard Project noted that no individual maps for any of the species included in the HCP were provided and suggested that documents be included providing the ranges and location of habitats.

Services' Response:
Maps displaying the distribution of terrestrial organisms in the Planning Area were not reliable or available for inclusion in the HCP. To compensate, the Applicant took three actions: (1) biologists and other individuals familiar with the Planning Area were consulted to provide site specific information and review the list of species known or suspected to reside in the Planning Area; (2) primary and secondary habitats were assigned to these species, based on studies and research conducted elsewhere, or verified from observations in the Planning Area (HCP Section 2.10.7). (In other words, if the Applicant had outside evidence or observations of habitat use by these species, they were assumed to use the same habitats in the Planning Area); and (3) only specific types of habitats were mapped and modeled as supporting these species in the Planning Area (see HCP Section 3.5.3). By assigning a "search area" for these species (see HCP Table 15), habitat assessments were focused around habitat preferences without depending on actual locations of animals to dictate retention.

h. Guilding

Comment Summary:
The WDFW, Yakama Indian Nation, Northwest Indian Fisheries Commission, Sierra Club-Cascade Checkerboard Project, Wilderness Society, Washington Environmental Council, five local organizations

(one with a petition signed by 82 signitures), and 16 individuals commented that lumping all wildlife into guilds (Lifeforms) ignores the variation among wildlife species, and the HCP should include species specific information. The Wilderness Society suggested that the DEIS lacks spatial analysis of the species covered in the HCP. The WDFW questioned how Plum Creek addressed uncertainty or conflicting opinions regarding Lifeform habitat needs and further stated that to be an effective tool in forest management, Lifeforms should be comprised of species that respond similarly to predominant changes in landscapes. The Northwest Indian Fisheries Commission felt that the Lifeform analysis used questionable assumptions about habitat requirements and late-seral characteristics. The Sierra Club-Cascade Checkerboard Project also stated that different species use different forest types and have different ranges. One local organization suggested that the HCP does not give a full scientific analysis of forest types and ignores individual wildlife species. Another commentor felt that the Lifeform concept can result in grouping species inappropriately. One individual commented that the Lifeform analysis used in the HCP was "bizarre." Another individual questioned the use of the term "guild" over "species assemblages."

Services' Response:
Although guilding is a standard practice used to assess and manage wildlife species with common habitat preferences, the Applicant recognized that the technique has in the past been overly generalized, particularly for diverse groups, and may not identify specific elements of the forest used by a given species as its primary habitat. Also, guilding may group species with habitat affinities that differ from the majority of the group. Because of this, and based on peer review comments, the Applicant refined the Lifeform approach to habitat analysis in several ways, as described in the EIS, Section 2.2.4.2 and HCP, Section 3.2.2. These changes included "splitting" some groups into subgroups to refine habitat preferences, assignment of primary and secondary habitat preferences with less emphasis given to secondary habitats, "delayed implementation" of some forest structure stages as habitat until the Applicant was confident that New Forestry practices were retaining the necessary structural components (e.g., snags), and constraining the GIS scanning area to assessing habitat conditions to fit specific biological requirements. Spatial analysis was not possible for some species because of incomplete knowledge of present occurrence, and reluctance to assume that present occurrence would remain "static" for 50 years. This concern was addressed by mapping and modeling all logical habitats the species could potentially occur in during the Permit period. These habitats are spatially displayed in HCP Figures 46 through 48. If opinions regarding habitat preferences were mixed, forest stand structure classes in question were relegated to secondary habitat or deleted entirely. In response to commentor concerns, more detail on structural classes within forest cover classes (e.g., Stand Initiation within Douglas-fir/hemlock) has been included (Table 30b). Individual wildlife Special Emphasis Species and Species of Concern were discussed in detail in HCP Section 3.5.2. which further reduced the potential for these species to be "lost" in Lifeform guilds. Assumptions on Lifeform habitat requirements and late-seral characteristics were based on published sources and expert opinion of local biologists. These assumptions would be evaluated with projects proposed under the monitoring program (HCP Section 5.2). The apparent "bizarreness" of Lifeform groupings is a function of similar habitat preferences by diverse organisms, a major tenet of ecosystem analysis. The example in question (Lifeform 4) which combines peregrine falcons and mountain goats is a common assemblage which has been used in previous wildlife compendia, and is based on observations of these species in similar habitats (e.g., rocks and talus). Peregrine falcons are discussed in more detail in HCP Section 3.5.2.4. The terms "guild" and "species assemblage" can be used interchangeably.

i. Habitat Associations

Comment Summary:
The Wenatchee National Forest suggested that habitat associations should be consistent with those used in the Northwest Forest Plan. The WDFW suggested that four additional habitats should be added to the HCP, including talus slopes, caves, mineral springs, and large, hollow snags. The Yakama Indian Nation felt that the habitat association analyses in the HCP were inaccurate, especially for late-successional species. The Wilderness Society suggested that there is a need to look at habitat associations from more of a landscape ecology perspective. The Sierra Club-Cascade Checkerboard Project and a local organization commented that the HCP needs to split out habitat associations on Forest Service land and those on Plum Creek's land and that there is no basis to assume that all species in Lifeforms would utilize secondary habitats to a significant degree. The Washington Environmental Council felt that many habitat associations were not considered in the HCP. Two individuals suggested that the indiscriminate value of secondary habitat being one-half as important as primary habitat is insensitive to differences between habitat specialists and habitat generalists. Two other individuals were concerned that the HCP does not consider that a species on the western side of the Cascades may use a vastly different kind of habitat than the same species in the dry parts of the east side.

Services' Response:
Incorporation of landscape ecology "principles" (which were not specified but are assumed to be elements, such as large patch size and connectivity) was not possible due to the "coarse-filter" nature of the analysis. Specifics on harvest unit layout and timing were not possible for multiple ownerships in the Planning Area and the extended time frame (50 or 100 years) for the analysis. These concerns were addressed by developing management units that represented reasonable ranges of patch sizes (see HCP Sections 2.6.2 and 2.6.3) and making reasonable assumptions about future harvest actions on Federal and nonfederal lands (see HCP Section 2.6.5). The analysis would not have been possible or considered compatible if different habitat associations had to be assumed for Forest Service and Applicant lands. Habitat associations were selected based on advice from local biologists and previous wildlife compendia. Concerns for additional habitats such as talus slopes and caves were addressed as Special Habitats (HCP Section 3.4). "Late successional species" are generally assumed to exist in forests with a substantial existing complement of snags, downed logs, large diameter trees, and canopy closure; the structural characteristics generally achieved in Mature, Managed Old-Growth, and Old-Growth Forests as described in the HCP (Section 2.3). Additionally, the Applicant's experience in spotted owl surveys and "New Forestry" experiments indicate that "Late successional species" are found in these experimental harvest units and in forests supporting spotted owls that are not "late successional" from a stand-age perspective. The Services recognize that the weighting of secondary habitat as only one-half that of primary habitat was arbitrary but reasonable after discussion with peer reviewers. Many species of concern that are "habitat specialists" such as pileated woodpeckers were included and analyzed separately in the HCP (Section 3.5.2). To address concerns that some species occurring ubiquitously in the Planning Area may in fact use different habitats on the east and west side of the Cascade crest, the analysis tended to focus on habitat components that must be in place regardless of geographic location, such as snags, wetlands, and talus slopes (HCP Section 3.5). When known, other sensitive species that are geographically restricted in the Planning Area (e.g., White-headed woodpeckers) were also noted and discussed separately (HCP Section 3.5.2).

2. Exotic Animals

Comment Summary:
The National Audubon Society requested additional analysis of the HCP in terms of invasions by exotic species. The Washington Environmental Council and Washington Native Plant Society commented that road building and harvesting from planned logging in the HCP provides routes for invasion by noxious weeds and invasive early successional animals.

Services' Response:
See Response to Exotic Species.

E. Species Interrelationships and Larger Ecosystem

Comment Summary:
One individual commented that increasing the rate of logging would destabilize ecosystems at a greater rate; two State representatives supported the ecosystem-based approach of the HCP; and the Washington Forest Protection Association supported the multiple species and large landscape approach of the HCP. Comments on two preprinted cards urged consideration of a healthy ecosystem and site-specific management to maintain sustainability. One individual sited numerous examples of complex interactions and the need to preserve these functions.

Services' Response:
Concerns regarding "destabilization" of ecosystems due to increasing harvesting rates in the Planning Area is not supported by data or assumptions used in the HCP. With the implementation of the Northwest Forest Plan on Federal ownership, additional State Forest Practices Rules and Regulations governing clearcut size and rate on State/private land, and implementation of the HCP on the Applicant's land, the "rate" of harvest activity in the Planning Area would be less than in recent decades. Assumptions for annual harvest on Federal lands in the Planning Area are described in HCP Section 2.6.5. A healthy ecosystem and sustainability of resources are goals of this HCP.

V. HUMAN ENVIRONMENT

Comment Summary:
The Wenatchee National Forest, the Yakama Indian Nation, four Members of the State Legislature, the Washington Forest Protection Association (WFPA), the Sierra Club-Cascade Checkerboard Project, the Sierra Club of California, three local organizations, and ten individuals (including five preprinted cards), commented on various aspects of the Alternatives and their relationship to the Human Environment. Topical comments focused on employment and economic analysis, sociological and cultural resources issues, and analysis of effects on recreational opportunities in the region of the Planning Area. Some reviewers characterized the presentation of effects as inadequate while others merely asked that these resources receive higher levels of protection. Finally, one reviewer rebuffed the Services for the entire treatment of issues related to the Human Environment for being "typically deficient" for not taking into account a universe of larger values at stake in the entire controversy surrounding resource usage and global human population expansion.

Services' Response:
The review developed in the DEIS needs to serve two purposes to comply with the spirit of NEPA. First, it should disclose the expected effects of the Proposed Action to the interested public. Second, it should provide the decision-making individual with enough information to make a sound decision based on the values expressed in NEPA.

The Services and the Applicant conducted extensive internal and external scoping to develop those resource issues that should be analyzed to meet each of the two purposes stated above. Following scoping, the Services reviewed the effects to a variety of resources that were raised in both internal and external scoping. In compliance with standards established in NEPA and its implementing regulations, the Services analyzed the effects of proceeding under a No-Action and three Action Alternatives. The analysis of these effects was conducted equally, with no Alternative receiving a higher level of attention than any other.

The initial threshold for review was whether a negative increment of effect would occur to the resource, based on a comparison of the effects under the No-Action Alternative and each of the Action Alternatives. Thus, as an initial matter, the Services viewed the differences in the activities proposed under the No-Action Alternative and each of the Action Alternatives.

Presently, teh Services note that the Applicant will be engaged in the activity of timber management under all of the alternatives. However, under the Proposed Action (i.e., HCP), and to differing degrees in the other Action Alternatives, the activities will be carried out with a greater level of regulatory certainty allowing for both a higher degree of planning and the implementation of a package of prescriptive activities designed to mitigate for anticipated adverse effects. The information developed by this review and presented in the DEIS fully discloses the expected effects and should be perfectly adequate to allow the decision maker to analyze the Proposed Action of issuing a permit.

A. Socioeconomic Issues

Comment Summary:
Generally, comments from four Members of the State Legislature and the WFPA were supportive of the efforts involved in developing and implementing an HCP, viewing the regulatory certainty it might provide as beneficial to local economies. Other individuals criticized the economic analysis for focusing on employment rather than on other economic values. One individual commented that fishing related jobs are as valuable as loggers' jobs. One individual urged a halt to exporting raw logs. The Sierra Club of California criticized the riparian protection and asked how California timber companies can be expected to provide adequate watercourse protection if competing companies in neighboring States are not required to do so. One individual remarked that timber industry careers will continue to decline regardless of whether harvest rates are slowed to a sustainable rate or not. Finally, one individual complained of generally insufficient analysis while another more specifically criticized the lack of discussion of impacts to downstream economies.

Services' Response:
The Services' analysis of effects under the alternatives was driven largely by information derived through internal and external scoping. The EIS Scoping Report was attached to the DEIS. Other than concern raised regarding the effect of implementing an HCP on local employment, external scoping did not generate much direction for the scope of this analysis. As a result, the Services examined previous similar proposals and the analyses that accompanied those environmental documents as precedents for this EIS. Given how

this issue is being handled for similar proposals in other regions of the country, the Services believe the Economic Analysis presented in the DEIS meets or exceeds the adequacy provided in those precedents.

The Services also note that 40 CFR 1508.14 states that "[w]hen an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment" The Services are not obligated to analyze every economic or social issue associated with forest management in this EIS; only those interrelated to the reasonably foreseeable environmental impacts associated with issuance of the Permit. As noted in the DEIS, economic activity, employment, and social issues are affected by a great number of variables most of which are unrelated to the environmental impacts associated with implementing the proposed HCP. Considering the number of variables affecting these issues, it is not possible to discern with any quantitative accuracy what effect (if any) the environmental effects of implementing the HCP might have upon measures of economic activity or changing social conditions. The Services note the link between healthy riparian systems and the economy of the fishing industry. Because of the potential for such "downstream" impacts, the Services have placed considerable emphasis on riparian protection in this Proposed Plan. Regarding the export of raw logs, the Services believe that economics can, in many ways, be as complicated as biology. Economics of natural resources can be doubly complicated; often an action has an unexpected result. The Services do not pretend to understand this dynamic, nor seek to manipulate the economic system. The Services note that the Applicant markets its products both domestically and abroad. The financial health of the Applicant is directly linked to its ability to minimize and mitigate impacts. Reasonable profits on its investments allow the Applicant to conduct its New Forestry experiments, retain additional trees in harvest units, and strive for longer rotations. These are the actions with which the Services are primarily concerned. The Services also note that regional differences exist between California and Washington in climate, tree species, and growth, State Forest Practices Rules and Regulations, and other such factors. Rather than allocate fairness, the Services have focused on addressing the needed riparian protections.

B. Recreation

Comment Summary:

The Wenatchee National Forest suggested that the analysis include the indirect effect of timber harvest on recreation occurring on adjacent National Forest land. The Sierra Club-Cascade Checkerboard Project stated the review was inadequate. The Northwest Motorcycle Association urged protection for trails, including buffers, trail maintenance, construction of bypasses, and trail signing. They further stated that they support roadless areas, conversion of decommissioned roads into trails, and a requirement for the Applicant to provide trails connecting with those trails on adjacent properties. They indicated a number of omissions in the description of the affected environment and the cumulative impacts. The Washington Trails Association emphasized the importance of wildlife encounters for recreational users. One individual discussed the importance of trail buffering while another criticized the lack of discussion of downstream impacts upon recreational use. One individual supported recreational use of the forest where compatible and another said recreational opportunities should be considered when the management of this unique and sensitive area is planned. Two individuals suggested decreased usage by off-road vehicles. Most commentors expressed concern for the degradation of recreational experiences as a result of implementing the Proposed Action. Others thought the analysis was inadequate. One writer proposed that the Services not view recreational opportunities as a “panacea” for foregone timber harvests and that recreation is rather a “major negative environmental impact.”

Services' Response:
Analysis of effects to these resources are reviewed in Section 4.12 (pages 4-85 through 4-90) of the DEIS. The Proposed Plan and each of the Action Alternatives propose varying degrees of riparian area protection, uneven-aged forest management, upland harvest deferral, and road closure, all of which directly or indirectly enhance habitat. In turn, these may enhance some aspects of recreational experiences while diminishing others. In fact, based on a review of the variety of comments received concerning these uses, the Services believe that recreational opportunities for some may degrade the experiences of others. In this regard, the Services have been called on to review a proposed Habitat Conservation Plan, and those values have received the most attention. The Services do not purport to pass judgment on the variety of recreational proposals engendered in public comment. Regarding the omissions, the Services have made the appropriate changes in Sections 3.11 and 4.12.

C. Cultural Resources

Comment Summary:
The Yakama Indian Nation, Sierra Club-Cascade Checkerboard Project, one other local organization, and one individual raised concerns about the adequacy of analysis. The Yakama Indian Nation pointed out that the DEIS Executive Summary incorrectly states an assumption relating reduced effects to presently unknown resources through protection of riparian areas (DEIS; page S-31). The Checkerboard Project asserted the analysis was inadequate. The local group asserted that omissions in the DEIS's analysis of this issue requires the preparation of a supplemental DEIS.

Services' Response:
The initial problem here, is the present lack of any useful information regarding the location of any potentially effected resources. Given this uncertainty, and as stated Section 4.11.2; page 4-84 of the DEIS, the Applicant has committed to a plan of action in every instance where resources of cultural value are discovered. This Plan would enable the Applicant to avoid effects in advance of occurrence. To embellish the Applicant's efforts in this endeavor, the Applicant has committed to the use of a predictive model for locating such resources. While all potential sites within the Planning Area would receive this level of protection, sites which may occur within RHAs or other special habitats would receive an increased level of incidental protection. An appropriate change in response to this comment now appears in the FEIS. The DEIS more properly should have stated that it is assumed that: *to the extent any presently unknown sites exist in those areas that would receive protection under the various proposed riparian protection schemes, those sites should benefit by being exposed to no effect or to a mitigated level of effect.* Nevertheless, as stated above, the Applicant has proposed a course of action when the potential for adverse effects arises. Fortunately, this relationship is more clearly and appropriately stated in the Environmental Consequences Section of the DEIS in Section 4.11; pages 4-83 through 4-85.

VI. MANAGEMENT PRACTICES

Comment Summary:
One local organization commented that the HCP is a mockery when it provides for less than one percent of Plum Creek's lands to be off limits to logging and no more than 10 percent to have special restrictions; one individual commented on the damage that Plum Creek's heavy and continued logging has caused; one individual commented that the sale of Plum Creek land could remove potential owl sites; and one individual commented that real change in management practices is required by the HCP, not just "business as usual".

Services' Response:
The amount of land not scheduled for harvest or placed under special restrictions is in response to the needs of a number of wildlife species and to provide linkages to habitat throughout the Planning Area. Section 3.6 of the HCP summarizes the wide range of mitigation measures the Applicant would implement. Provisions in the HCP to provide a minimum of 8 percent of the Applicant's land in NRF habitat (i.e., greater than 13,000 acres) over the Permit period, 7 percent of the Applicant's land in RHAs (i.e., about 11,000 acres) managed to at least FD habitat (see HCP Section 3.3), and greater than 40 percent of the Applicant's land as FD habitat by the end of the Permit period (see HCP Table 24) represent significant features of the Plan. The HCP is a multi-species, ecosystem-based Plan that balances conservation efforts for the spotted owl as well as 284 other wildlife species. The No-Action Alternative (i.e., Current Regulations) would not implement RHA and RLTA guidelines, additional wetland protection, or snag and green tree retention, other than that required under State Forest Practices Rules and Regulations. Furthermore, grizzly bear road closures, watershed analysis throughout the entire Planning Area, adaptive management, and research and monitoring efforts would not be conducted under the No-Action Alternative.

The potential impact of land sales on the Planning Area is discussed in Section 5.3.4.2 and limitations on the amount of land sales is in discussed in Section 5.3.4.3 of the HCP. The Applicant is committing to management practices which generally exceed those required by State Forest Practices Rules and Regulations and the Applicant's Environmental Principles (Appendix 2 of the HCP). In this Plan, site-specific restrictions have been partially replaced with landscape-level commitments. Also see response to Harvest Methods.

A. Amount of Harvest

Comment Summary:
The Sierra Club-Cascade Checkerboard Project and one local organization commented that the minimum percentage of the land in the Planning Area that would be maintained or that would regenerate the structural and species diversity of old-growth forests is too small. The Wilderness Society suggested that Plum Creek should reduce harvesting operations in Late-Successional forest habitat. Eighty-three members of a local environmental group and three other individuals commented that the harvest rate proposed for the Planning Area would not be sustainable in terms of wildlife habitat. Three individuals commented on the proposed increase in harvesting and leaving less than one percent of Plum Creek's land as old-growth in 50 years. One individual suggested that no more than 10 percent of the volume of a stand should be harvested in a given rotation. One individual commented that the proposed harvesting schedule represents a severe threat to Northwest species. One individual was concerned about owl sites if Plum Creek decides to harvest more aggressively. Three individuals on preprinted cards urged for no logging.

Services' Response:
Old-growth is defined in Section 2.3 of the HCP as trees in excess of 200-years old. The current amount of old-growth forests in the Planning Area and projected increases over the Permit period are summarized in Table 30 of the HCP. Since age is the determining factor for this structural stage, only a limited amount of the existing stands would attain this age. The Applicant's old-growth estimate is also shown in Table 30. Although the table shows an increase in old-growth forests from 1 percent to 2 percent, the actual increase is 1.4 percent to 1.6 percent on the Applicant's land. Habitat conditions for all species

are summarized in Table 26 of the HCP. The percentage of a stand to be removed during the Permit period would be determined by the desired habitat conditions for each stand after harvest. Consideration of the Applicant discontinuing timber management on its lands was discussed in DEIS Section 2.1.5.1 (see FEIS Section 2.0).

B. Rotation Age

Comment Summary:

The Sierra Club-Cascade Checkerboard Project and one individual suggested rotations should be on the order of 100 to 200 years and the HCP should include a sustained yield provision.

Services' Response:

As stated in the response to the amount of harvest, habitat conditions in the Planning Area would impact rotation ages combined with the economic and silvicultural maturity of the stands which varies by the quality of the stand site and the tree species on the site. Arbitrary rotation ages such as 100 or 200 years or rotation ages based on a sustainable yield would not meet the objectives of the HCP. However, the Applicant anticipates a rotation age of between 65 and 120 years, depending upon site conditions and tree species.

C. Harvest Schedule

Comment Summary:

The Northwest Indian Fisheries Commission expressed concern for the acceleration of harvest of old-growth stands in the near-term with only a promise of future desired habitat conditions in the long-term. The Sierra Club-Cascades Checkerboard Project commented that the HCP lacks any planned harvest schedules or timetables with respect to specific watersheds; one individual commented that deferrals should not be harvested until habitat of equivalent quantity and quality comes on line; one individual asked what percentage of the land would be cut each year; one individual asked what if Plum Creek decides to harvest more aggressively to feed economic demands for timber; and one individual did not see in the HCP any data supporting how the increased rate of logging would maintain viable long-term habitat protection.

Services' Response:

Harvest schedules are impacted by the factors discussed above under Rotation Age. Under the HCP, the Applicant is committed to meeting biological objectives which would limit the amount of harvest and location of harvest which would otherwise be scheduled if the Applicant's only objectives were economic. The amount of old-growth scheduled for harvest in the HCP is not accelerated due to the fact that there is limited existing old-growth currently available in the Planning Area. An approximation of the percentage of the Applicant's land that could be harvested over the Permit period can be determined from the information provided in Table 2 of the DIES. Annual harvest varies based on the habitat conditions present at any point in time. As stated above under Amount of Harvest, Table 26 of the HCP summarizes habitat conditions throughout the Permit period.

D. Harvest Methods

Comment Summary:

The Sierra Club-Cascade Checkerboard Project and 20 individual reviewers (two comments on preprinted cards) commented on their concerns regarding the extent of clearcutting in the Planning Area. One local organization and one individual suggested that continued clearcutting would negatively impact salmon and bull trout habitat. One local organization suggested that the HCP is vague in terms of

harvest techniques. One individual at the College of Forest Resources, University of Washington commended Plum Creek on its use of retention and partial cutting techniques currently used in the Planning Area. One individual on a preprinted card suggested that German forestry techniques be studied for their beneficial use in the Planning Area.

Services' Response:
As discussed in Section 1.2.3.1 of the HCP, the Applicant uses even-aged (i.e., clearcutting) and uneven-aged (e.g., overstory removal) harvesting techniques in its ownership in the Cascade range. In 1994, the Applicant used even-aged harvesting in approximately 17 percent of its lands east of the Cascade crest, and in about 65 percent of its operations west of the Cascade crest. The amount of clearcutting in the past has been higher due to accepted past management practices but has been significantly reduced in recent years with the Applicant's voluntary compliance with it's Environmental Principles (Appendix 2 of the HCP).

To fulfill its commitment to the application of its Environmental Principles, the Applicant conducts variations on even-aged harvesting techniques where necessary to maintain structural diversity. For example, to achieve this objective in the Planning Area, the Applicant would leave not only dominant/co-dominant, vigorous trees, but also leave trees with a variety of species, diameters, and vigor classes (i.e., dead and dying trees) to maximize structural diversity. The Applicant would also conduct selective or partial harvests in the Planning Area, such as overstory removal, which involves harvesting trees that comprise the upper canopy layer to encourage rapid growth of trees in the understory, thereby, creating an uneven-aged stand. Two examples of how New Forestry techniques have been applied by the Applicant in the Planning Area are shown in Appendix 7 of the HCP.

To protect and enhance environmental values of forests and streams, the Applicant would ensure that riparian buffers are maintained, as outlined in Section 3.3 of the HCP, as priority areas for fish and wildlife habitat protection, and would ensure that all harvest units on both the east and west sides of the Cascade crest, fulfill the standards established for wildlife reserve trees as stipulated by current State Forest Practices Rules and Regulations. The Applicant has participated in international forestry conferences where current information on New Forestry management techniques has been presented.

E. Yarding Methods

Comment Summary:
One individual asked if there are any limitations to logging on steep slide-prone slopes and if more environmentally friendly methods such as thinning and helicopter logging would be used in remote areas.
Services' Response:
The Proposed Plan does not dictate yarding methods. The Applicant must follow State Forest Practices Rules and Regulations and watershed analysis prescriptions. The Applicant's use of New Forestry has produced many good examples of alternative harvest techniques including different types of tree retention (dispersed, clumped, contour) (see HCP Appendix 7) and use of helicopters in harvesting.

F. Yarding Corridors

Comment Summary:
The Yakama Indian Nation commented that yarding corridors in RHAs would reduce LWD recruitment, decrease shading, provide conduits for sediment delivery, and destabilize stream banks; the Sierra Club-Cascade Checkerboard Project commented that 20 percent of each stream mile could be impacted by

yarding corridors under the HCP; one local organization asked if research shows that spotted owl nests or roost sites are located in managed riparian zones with yarding corridors; and one individual commented that yarding corridors would be left to Plum Creek's discretion.

Services' Response:
An experimental harvest unit, using yarding corridors, was completed by the Applicant in 1995. The Applicant documented spotted owl use in the stands within two (2) months following harvest. Within the Planning Area, 20 percent removal of riparian vegetation for yarding corridors would not be applied consistently on every stream mile and, in most harvest units, yarding corridors would not be used at all. These corridors would be used by the Applicant as an alternative to building additional roads and should affect only a minor part of the riparian corridor. The Applicant would minimize the need for, and the number of trees removed when using yarding corridors (Section 3.3.3.1). The yarding corridors would not provide conduits for sediment delivery because logs would be suspended by cables and would minimally reduce LWD recruitment and shading. Yarding corridors would not be placed in areas that can destabilize stream banks.

G. Slash Disposal

Comment Summary:
The Northwest Indian Fisheries Commission commented that on Page 11, paragraph 2 of Appendix 5 of the HCP, a prescription is given for the dumping of slash into Type 4 and 5 streams which is illegal under State Forest Practices Rules and does not function as LWD.

Services' Response:
This paragraph does not state that slash would be placed into streams. Because smaller pieces of wood can function in small streams, the reference to branches and tops of trees simply indicates that this size of wood can be expected to provide some amount of pool habitat, cover, and sediment storage. This wood could enter the stream naturally from windstorms, mortality, disease, or incidentally during harvest. The State Forest Practices Rules and Regulations only prohibit placement of excessive amounts of slash that could cause damage to public resources (WAC 222-30-100).

H. Insecticides and Herbicides

Comment Summary:
The Sierra Club-Cascade Checkerboard Project requested information regarding the Plan's provisions for using insecticides and herbicides.

Services' Response:
Section 1.2.3.3 in the HCP describes the guidelines for insecticide and herbicide application as required by State Forest Practice Rules and Regulations, and the Applicant's efforts to minimize usage of these chemicals is also described. These guidelines include a 50-foot, no-spray buffer on all flowing streams, no application within riparian management zones, 200-foot buffers around residences, and a 100-foot buffer adjacent to agricultural lands and caves.

I. Replanting

Comment Summary:
The Washington Environmental Council recommended that a minimum survival rate of 80 percent of all planted species should be considered and a commitment is needed to replanting in the same species

proportion that was harvested. Two individuals on preprinted cards also suggested that replanting include mixed species (including noncommercial species) to promote regrowth of natural forests.

Services' Response:
Section 1.2.3.2 of the HCP describes the Applicant's practices with regards to reforestation. A specific survival rate is difficult to prescribe because mortality varies greatly depending on a number of factors including site conditions, species planted, weather, and density of trees planted. If areas do not reforest to adequate stocking levels, the Applicant is required by State Forest Practice Rules and Regulations to replant the area (Appendix 5). Replanting with the same proportion of species is not always desirable (e.g., alder stands that become established following past harvest without replanting of conifers). Reforestation often includes the same species proportions as occurred naturally in the stand because those species are adapted to the specific site conditions. Section 1.2.3.2 of the HCP describes a number of species that are planted by the Applicant in addition to Douglas-fir.

J. Growth and Fertilization

Comment Summary:
One individual commented that the determination of no significant net loss of suitable spotted owl habitat over the Permit period due to the growth of younger stands is based on skewed interpretations of data and not grounded in good, peer-reviewed, accepted science; and two individuals commented that the key assumption regarding growth of stands is that they would become suitable for owl habitat over time.

Services' Response:
Growth of stands was modeled using FIBRPLAN (Section 2.7). FIBRPLAN is a generally accepted, growth simulation model that is grounded on principles that have adequate, peer-reviewed, and accepted science. A number of groups including the Interagency Spotted Owl Committee and the Spotted Owl Recovery Team have assumed that owls would move to areas of available habitat as forested stands develop in the future. The required stand conditions for spotted owl use are based on other studies in the Pacific Northwest and monitoring/survey work within the Planning Area (see Spotted Owl - NRF and FD habitat).

K. Thinning and Salvage

Comment Summary:
One local organization commented that abuse of natural resources can occur under the guise of "salvage" and "timber stand improvement" operations.

Services' Response:
The Services do not believe that abuse of natural resources would occur under the guise of "salvage" or "stand improvement" operations. Monitoring (Sections 5.1 and 5.2), as well as the guidelines of the Implementation Agreement (Section 5.3), would ensure that natural resources are being protected in the Planning Area over the Permit period.

L. Road Management

Comment Summary:
The Yakama Indian Nation and a local environmental organization suggested that the HCP is vague in regard to plans for building roads. The Northwest Indian Fisheries Commission commented that Plum

Creek should commit to an overall road density of 1.0 mile per square mile and decommission roads to meet road density standards. The Northwest Indian Fisheries Commission also wondered why roads scheduled for closure are located only in the I-90 Lakes Subunit, and why there is no plan in the HCP for culvert removal or regular maintenance. The Puyallup Tribe of Indians commented that road design standards should exceed State Forest Practices Rules and Regulations. The Washington Native Plant Society suggested that road building would provide routes for invasion of noxious weeds. The Sierra Club-Cascade Checkerboard Project, four local groups, and 27 individuals commented that Plum Creek should either not build more roads, or reduce the number of roads through decommissioning or gating. The Washington Environmental Council, 23 individuals, and 424 pre-printed cards suggested that Plum Creek should reduce road mileage to protect salmon and trout, and wildlife. One individual complained that road building would be based on economics and not on adverse effects to species and biology. The Northwest Ecosystem Alliance recommended no more than one mile of roads per section throughout the HCP area.

Services' Response:
Reduction of sediment into streams from roads has been and would continue to be a primary objective of the Applicant's watershed and forest management activities (Section 3.3.3.1). Rather than simply reducing road mileage blindly, the Applicant would use the HCP as a tool to identify the most difficult road-related problems in each watershed and allow the Applicant to employ a number of strategies to address the roadway problems. In many cases, this would translate into abandonment or closure of roads and a subsequent reduction in road mileage (Sections 1.2.3.4 and 3.6.9). Watershed analysis would help the Applicant to identify sensitive areas where road design standards need to exceed current State Forest Practices Rules and Regulations. Noxious weeds that have the potential to become significant seed sources would be eradicated to the extent practicable. The adverse effects of road construction on the biology of the area is considered explicitly in the HCP (Sections 3.3.3.1 and 3.6.9). The Applicant is committed to reducing road densities across its ownership; however, a target of 1.0 mile per square mile is not practical in all areas of its ownership. Maintenance plans for road improvements and culvert removal are in place throughout the Applicant's ownership, not just in the I-90 Lakes Subunit. The I-90 Lakes Subunit is simply an area of special emphasis because of the grizzly bear.

M. Access Issues

Comment Summary:
The EPA commented that no details are provided in the DEIS of where future land access may be pursued; one individual supported the past actions by Plum Creek to eliminate the use of off-road vehicles in certain areas.

Services' Response:
The Applicant's needs for access are dynamic due to changing regulatory and topographic conditions. Projects currently deemed appropriate may change over time and would be managed based on the conditions in existence at the time of the access need (see Section 1.8 in the HCP).

N. Restoration

Comment Summary:
The Puyallup Tribe of Indians suggested that a mitigation fund be established for active restoration for projects in key watersheds and 303(d) stream segments. The Northwest Indian Fisheries Commission

commented that the HCP does not adequately address the restoration of closed roads, and asked if Plum Creek is planning restoration of 303(d) stream segments. One individual urged that present roads be restored to grade and replanted where possible to protect fish habitat; two individuals (one comment on a preprinted card) stressed the importance of restoring and maintaining habitat for salmon and bull trout.

Services' Response:
Some abandoned roads are restored to grade and replanted, but for reasons such as maintaining fire access or thinning in the near future, many roads are not restored to grade. The abandonment procedures, however, are equally effective in minimizing road-related erosion (Section 3.3.3.1). The Services believe the HCP is an excellent blueprint for restoring and maintaining habitat for salmon and bull trout. The Applicant is funding a great deal of mitigation for the restoration of many watersheds through the HCP as well as working with other groups such as the Forest Service. Watershed analysis would be the primary process for addressing road abandonment and restoration.

VII. NEPA COMMENTS

Comment Summary:
Fifty-three reviewers (43 letters) commented on various aspects of NEPA and NEPA compliance regarding the present Proposed Action. These included WDFW, two members of the State Legislature, A Professor at the University of Washington's College of Forest Resources, the Muckleshoot Indian Tribe, the Tulalip Tribes, the Washington Forest Protection Association, the Defenders of Wildlife, National Audubon Society, Sierra Club-Cascade Checkerboard Project, the Wilderness Society, the Washington Environmental Council, four local organizations, and 27 individuals. Two tribal comments and two environmental organization comments (1 letter from 8 organizations) specifically requested extension of the comment period, but later submitted additional comments as well. All such comments are represented in the above summary.

The topical matter raised in public comments included issues of general NEPA concern, range of reasonable alternatives, the Services' formulation of the No-Action Alternative, the length of the public comment period, the clarity of announcements of availability of materials for review, the cumulative effects analysis, the Services choice of environmental document, and the scientific credibility of the analysis presented, all of which are addressed below by topic. One commentor decried the lack of an index to the DEIS. The Defenders of Wildlife suggested the EIS contain some discussion of "The Precautionary Concept" of conservation planning. The Wilderness Society accurately pointed out that NMFS had been omitted from the list of preparers. One individual requested the provision of a flowchart illustrating the process of issuing an ITP, while another stated his belief that the ROD had already been "inked."

Services Responses:
An index was prepared in response to the above comment. The name of the individual representing NMFS was added to the List of Preparers. The context Section of this document should provide sufficient background on the section 10 process, especially as it has been carried out for this Proposed Action. Future steps include 30 day public review of this document, Statement of Findings (ESA §10) prepared by the Services, a Biological Opinion (ESA §7), and a Record of Decision (NEPA). Not until all of these documents have been completed and reviewed by the responsible officials would a decision on permit issuance be made.

A. Range of Reasonable Alternatives

Comment Summary:
The Sierra Club-Cascade Checkerboard Project, Wilderness Society, and two local organizations expressed frustration at the number of alternatives considered in the DEIS. At least one commentor disagreed that the applicant should determine the alternatives. Some reviewers asserted that this application could not

be properly reviewed without consideration of alternatives based on implementation of the "FEMAT Aquatic Conservation Strategy" or complete deferral in the presently roadless areas until land exchanges occur. The Cascade Checkerboard Project requested the release of feasibility data.

Services Responses:
These alternatives were considered in Section 2.1.5; pages 2-6 to 2-8 of the DEIS. They were eliminated from detailed analysis in accord with 40 CFR 1502.14(a). Specifically, the DEIS "rigorously explores and objectively evaluates all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discusses the reasons for their having been eliminated." Section 2.1.5 of the DEIS could have more clearly stated the reasons underlying the decision to eliminate certain alternatives from detailed analysis. This language has been changed since publication of the DEIS (see FEIS, Section 2). As a result, the FEIS contains the language below, inserted in response to those comments reflecting uncertainty as to why some alternatives were not analyzed in further detail.

One reviewer directed its criticism of language regarding the Alternatives contained in the Executive Summary. On page S-7, the DEIS mistakenly asserts that the Applicant does not consider an alternative viable if it precludes economically beneficial use of its lands. Obviously, under NEPA, the decision as to what alternatives would be considered in detail is not the Applicant's to make, and the DEIS should not have contained such an assertion. Accordingly, this language is changed in the FEIS to reflect the actual process and criteria invoked by the Services in eliminating certain alternatives from detailed analysis, as detailed below.

Regarding comments disputing that an alternative could be eliminated from detailed analysis because the proposal was not operationally or economically feasible to the Applicant, the Services disagree. For the action of issuing an Incidental Take Permit under section 10 of the Endangered Species Act, the reasonable range of alternatives is proscribed by the Action (Permit issuance based on the Proposed Plan) and No-Action Alternative (no Permit issued, activities proceed under the present regulatory regime, to the extent there is one). Section 10(a)(2)(B) permit issuance criteria requires that the Proposed Action Alternative (issue a section 10 permit on the basis of the HCP) must minimize and mitigate potential effects of expected take, to the maximum extent practicable. Thus, the outside limits of what is practicable are set in the proposed HCP (See also, Services' response to comments asserting this issuance criterion has not been met by the Applicant). Furthermore, even in intra-Service section 7 consultation, the Services may only propose "reasonable and prudent measures" in the event the Proposed Action is found to jeopardize a species for which coverage in the ITP is sought. In turn, any package of prescriptive activities over and above those in the Proposed Action (such as those stated in alternatives eliminated from detailed analysis) necessarily exceed the scope of the Proposed Action. This is because in the HCP the Applicant has proposed a package of prescriptive activities designed to minimize and mitigate effects of the Proposed Action to the maximum extent practicable. Thus, the alternatives that are presented for detailed analysis in the DEIS represent those courses of action that the Applicant could practicably implement.

As a final note, guidance from Council on Environmental Quality (CEQ) in "Forty Most asked Questions Concerning CEQ's National Environmental Policy Act Regulations" states that the scope of alternatives in licensing and permitting situations should consider what is reasonable. CEQ said that "Reasonable alternatives include those that are practical and feasible from the *technical* and *economic* standpoint and using common sense rather than what is simply *desirable* from the standpoint of the Applicant." CEQ also states in its Guidance Regarding NEPA Regulation (Federal Register/ Vol. 48, No. 146/ July 28, 1983)

"There is, however, no need to disregard the Applicant's purposes and needs and the common sense realities of a given situation in the development of alternatives." The Services believe there would be little point in analyzing a series of alternatives which are unlikely to be implemented by the Applicant. (In *Residents in Protest --I-35E v. Dole*, 583F. Supp. 653, 660-61 [D. Minn. 1984] the court stated: "*A reasonable alternative is one which would effectuate the purposes of the project. If an alternative does not implement the purposes of the project it certainly is not reasonable and no purpose would be served by requiring a detailed discussion of its environmental effects since the alternative would never be adopted*.").

B. No-Action Alternative

Comment Summary:
Comments on the No-Action Alternative were made by WDFW, the Muckleshoot Indian Tribe, National Audubon Society, the Sierra Club-Cascade Checkerboard Project, one local organization, and two individuals. Comments fell into two distinct categories: (1) the No-Action Alternative looks better for owls than any of the Action Alternatives; and (2) the No-Action Alternative was deliberately understated to create a deceiving comparison with the action alternatives. For example, one reviewer asserts that the No-Action Alternative should not be based on "inadequate and old Washington State standards." Another reader asserts that watershed analysis must be considered part of the No-Action scenario, for reasons that were not very clear in that reviewer's letter.

Service Response:
With regard to category No. 1, additional language to clarify the impacts of the No-Action Alternative on spotted owls has been added to the DEIS (see FEIS, Section 2, subsection 4.8.1.1). The Services note that the No-Action Alternative contains many uncertainties. Assumptions regarding constrained owl habitat were very conservative. The Services also believe that a multi-species plan must be viewed as a whole. As such, the merits of the Proposed Plan far outweigh any percieved benefits of No-Action.

Comments regarding category No. 2 are premised on a mistaken understanding of NEPA's No-Action Alternative requirement. In response, the simplest way to define the No-Action Alternative in the context of the Proposed Action is "No-Action." The Proposed Action is to issue a Permit under the ESA. No-Action means the Services would not issue the requested Permit, and the Applicant would not implement the Proposed HCP. No-Action is defined by the realm of regulatory constraints that the Applicant would operate under *without the Permit*. These constraints include, among other things, the ESA section 9 prohibition of take, and all presently applicable laws and regulations affecting forestry practices in Washington State. Although State watershed analysis does appear in the Forest Practices Rules and Regulations, engaging watershed analysis is *voluntary* in Washington. Since the extant benefits of watershed analysis for those resources that receive protective prescriptions meet or exceed those that would accrue under a regime of straight standard forest practices, the Services appropriately formulated Action Alternatives proposing watershed analysis as a mitigating and minimizing component. Conversely, there is no legal basis for the Services to consider watershed analysis as a component of the No-Action Alternative. Finally, the United States Fish and Wildlife Service is not an arbiter of the quality of State Forest Practices Rules and Regulations. The Services do not view the section 10 process as an appropriate forum to address perceived inadequacies in those regulations.

C. Public Comment Period

Comments Summary:
In a single letter, the Sierra Club-Cascade Checkerboard Project and seven other local organizations petitioned the Services for an extension of the public comment period. Other comments received either requesting an extension or expressing disappointment at the length of the comment period were the Muckleshoot Indian Tribe, Tulalip Tribes, Sierra Club-Cascade Checkerboard Project, two local organizations, and five individuals. One individual thanked the Services for extending the comment period for two weeks. In most cases, the commentors requesting further time for review also provided the most profound and comprehensive sets of commentary.

Services' Response:
In response the Services note that the Statutory public comment period runs 45 days. Department of Interior policy does **not** require a 60-day comment period for EISs. Department of Interior guidance recommends 60 days or more *"from the date of transmittal to [EPA]"* (516 DM 4.24). This is to ensure that the public would be provided the full 45-day comment period required by NEPA (40 CFR 1506.10(c)). That period initiated on filing with the EPA and publication in the Federal Register, and ran through January 8, 1996. At about that time, in response to multiple demands, and while balancing the needs of the Applicant with those stated by other members of the public, the Services extended the public comment period by 14 days to January 22, 1996.

D. Announcements Regarding Availability

Comment Summary:
One individual complained about the inadequacy of news releases regarding the Proposed Action and public comment period.

Services' Response:
In response, the Services can only state that in addition to the publication of notice in the Federal Register, the Services released notices to news organizations of local and regional coverage, as well as announcing proposed timing of events at a full slate of public meetings immediately preceding publication of the Notice of Availability. All efforts were thoroughly calculated to provide as effective a notice as possible within the context of the Proposed Action. The Services are disappointed that any member of the public felt left out as a result of lack of notice.

E. Cumulative Effects

Comment Summary:
One commentor, the Tulalip Tribes, suggested the renaming of the Technical Report on salmonid limiting factors to "cumulative effects". Other commentors included the Wilderness Society, Washington Environmental Council, Sierra Club-Cascade Checkerboard Project, and one individual. Criticisms of the Cumulative Effects subsection range from flat assertions of inadequacy to specific actions that should have been considered to comply with NEPA. One reviewer criticized the cumulative effects analysis as "over optimistic". Several reviewers mentioned the development occurring in the I-90 corridor.

Connected actions were another subject of comment under Cumulative Effects. A few reviewers did comment that the Services should consider the entire Northwest Forest Plan politically and/or legally unstable enough to warrant reanalyzing cumulative effects including the possibility of no comprehensive forest plan. Some commentors criticized the analysis for not considering any number of current proposed rules such as the Department of Interior proposed 4(d) Special Rule for the northern spotted owl, or the State's proposed northern spotted owl and marbled murrelet rules.

Services' Response:
NEPA's cumulative effects definition appears at 40 CFR 1508.7, as follows:

> *Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.*

The Services disagree that the Cumulative Effects analysis is over optimistic. The Proposed Action results in fewer adverse effects than the No-Action Alternative. As a consequence, there is no way for the Proposed Action to contribute more to cumulative effects than the No-Action Alternative.

The Cumulative Effects subsection also analyzes "connected actions." 40 CFR 1508.25. Not included in the list of actions analyzed in conjunction with the Proposed Action under Cumulative Effects are possible Federal Timber Sales released under Section 2001 of the Rescissions Act signed into law in July 1995 (PL 104-19). The Services believe that no Federal timber sales released under the above cited Act exist in the region of the Planning Area. On that basis, no such sales were analyzed as past, present, or reasonably foreseeable future actions warranting inclusion in cumulative effects analysis. The suggestion regarding the instability of the Northwest Forest Plan is too remote and speculative to be considered reasonably foreseeable. See responses to comments regarding Federal Deviations from Management Plans on Federal Lands.

None of the rulemaking processes mentioned in public comments is close to finalization and that divining the results would be too remote and speculative to allow any realistic analysis. However, the Services note that a proposed Special Emphasis Area (under the proposed 4(d) Special Rule) incorporates most of the Planning Area.

F. Type of Documentation (EA vs. EIS)

Comment Summary
The Sierra Club-Cascade Checkerboard Project suggested that the Services' decision to prepare an EIS was appropriate, but, the Checkerboard Project and Mountaineers suggested the need has arisen to prepare a supplemental DEIS due to deficiencies such as data analysis, alternatives discussion, and cumulative effects analysis. They further stated that a supplemental DEIS is needed due to the Services' failure to provide a monitoring regime and public review process.

Services' Responses:
Supplemental statements are governed by 40 CFR 1509.2(c), which states, in relevant part:

Agencies[ ] shall prepare supplements to either draft or final environmental impact statements if: [ ] the agency makes substantial changes in the Proposed Action that are relevant to environmental concerns; or [ ] there are significant new circumstances or information relevant to environmental concerns and bearing on the Proposed Action or its impacts.

The Services dispute that either of the above-stated criteria have been triggered. In no instance has a substantial change been made or significant new information or circumstances arisen. In a thorough effort to be responsive to issues raised during public comment, certain measures proposed in the HCP have been revisited, with concomitant attention in the FEIS. Further, where public comment has revealed a need for further analysis, clarification, or explanation, that has been provided in the FEIS, appropriately embellishing or replacing material present in the DEIS.

G. Scientific Credibility

Comment Summary:

Comments were received from two Members of the State Legislature, a University of Washington Professor, Defenders of Wildlife, the Washington Environmental Council, the Washington Forest Protection Association, two local organizations (one with an 82 signature petition), and at least 18 individuals. While several reviewers congratulated the Services for the analysis prepared and presented in the DEIS and the Applicant for that provided in its Technical Reports and HCP, many others criticized the same. Some questioned the ability to be rigorous enough to warrant issuance of a long-term Permit. Others expressed concerns regarding "industry science." Several reviewers questioned the credibility of the scientific inquiry underlying the analyses in this application. One reviewer questioned whether the Services were relying on "the best and most current science" when the No-Action Alternative was formulated using the Forest Practices Act baselines?

Service Response:

The Services and the Applicant engaged the expertise of multiple Federal and nonfederal agencies in preparing and reviewing these documents. Examples included Services personnel with professional expertise, Tribal representatives, EPA, Forest Service, and WDFW. The Technical Reports underlying much of the Applicant's efforts were reviewed by numerous non-affiliated individuals, to the satisfaction of Services' Biological Staff. The subject of peer review is handled as a discrete topic elsewhere in this appendix (see Response to Peer Review). The Services appreciate the concern that arises with the length of the requested Permit in view of the accumulation of new information over time. However, reviewers are reminded once again that the alternative to HCP implementation remains 50 to 100 more years of land management under the present regulatory regime and the further uncertainty of following that path.

It would be inappropriate for the Services to use other than standard forest practices to describe the baseline of activities the Applicant would be allowed to implement under the No-Action Alternative. This formulation is simply a matter of determining how the Applicant would operate without an Incidental Take Permit and the proposed HCP. This topic is discussed in further detail in response to comments on *NEPA -- No-Action Alternative*.

VIII. HCP IMPLEMENTATION ISSUES

General Comment Summary:

The Services received at least 55 comments containing 57 signatures regarding implementation of the

Proposed Plan. Comments were received from the EPA, the WDFW, the Puyallup Tribe of Indians, Northwest Indian Fisheries Commission (two letters), a University of Washington Professor, the Defenders of Wildlife, National Audubon Society, Environmental Defense Fund, Sierra Club-Cascade Checkerboard Project, Northwest Ecosystem Alliance, Washington Environmental Council, six local groups, and 37 individuals. Comments were various and will be discussed by topic, in kind, below.

A. Length of Plan/Permit

Comment Summary:
A total of 28 comments with 29 signatures, discussed the length of the proposed permit. Commentors included the Defenders of Wildlife, Sierra Club-Cascade Checkerboard Project, two local groups, and 25 individuals (one comment on a preprinted card). Comments almost unanimously criticized the proposed 50-year Permit period and 50-year "Safe-Harbor" proposal. Some stated general concern. The Sierra Club-Cascade Checkerboard Project suggested a 30-year alternative length with renewal every 10 years if the Services determined conditions were being met. Others also proposed alternative methods of breaking up the length of the proposed Permit into multiple, shorter terms followed by review before renewal. The Sierra Club-Cascade Checkerboard Project stated there is no precedent for 100-year commitment to management of natural resources.

Services' Responses:
In enacting the provision for Incidental Take Permits, Congress intended that the agencies *"utilize this provision to approve conservation plans which provide long-term commitments regarding the conservation of listed as well as unlisted species and long-term assurances to the proponent of the conservation plan . . ."*. H. Rept. No. 835, 97th Cong., 2d Sess. 30 (1982). Congress vested the Services' with "broad discretion" in carrying out this provision to determine the appropriate length of any section 10(a) Permit "in light of all the facts and circumstances of each individual case." Id. at 31. In determining whether to issue a long-term permit, the Services' were instructed to consider "the extent to which the conservation plan is likely to enhance the habitat of the listed species or increase the long-term survivability of the species or its ecosystem." Id. Accordingly, FWS regulations provide that the duration of permits "*shall be sufficient to provide adequate assurances to the permittee to commit funding necessary for the activities authorized by the permit . . ."*. In determining the duration of the permit, the Services are required to consider the *"duration of the planned activities, as well as the possible positive and negative effects associated with permits of the proposed duration on listed species, including the extent to which the conservation plan will enhance the habitat of listed species and increase the long-term survivability of such species."* 50 C.F.R. § 17.22(b)(4).

The utility of several short-term permits is questionable in view of the context for which the applicant seeks an ITP here. Forest management is a long-term enterprise requiring long-term investments. The HCP proposes a package of landscape, stand and site-level mitigation measures, many of which also require long-term commitment to realize. A Permit of 5 to 10 years duration would not allow for some of the beneficial results to be recognized. The Services' main concern was that the Permit term be long enough to adequately mitigate for the potential take. The Murray-Pacific multi-species HCP is a 100-year commitment.

B. Transfer of Land/Other Rights

Comment Summary:
The Northwest Indian Fisheries Commission and the Sierra Club-Cascade Checkerboard Project expressed the belief that the Applicant, but not the Services, is able to easily terminate the Permit. One of these reviewers expressed concern that, since the early reduction of NRF habitat was allowed, Plum Creek could terminate the Permit after achieving its benefits with little consequence, and even avail itself of the "Safe Harbor" provision. The other reviewer stated that Plum Creek's obligations at termination should be clearly defined, particularly regarding what constitutes sufficient mitigation. At minimum, the reviewer states, the Company should be required to provide a complete termination report and commit to conduct whatever mitigation may be necessary to comply with the HCP. Furthermore, the reviewer suggested that all renewal options and the "Safe Harbor" provision should terminate if the company elects to terminate the Permit early or the Services terminate because of Plum Creek's substantial noncompliance.

Services' Response:
The IA would recognize the Applicant's right to terminate the Permit consistent with existing regulations. However, it also would explicitly mandate a termination report and compliance with the Permit condition requiring that any past incidental take has been sufficiently mitigated. It would be impossible at the time of Permit issuance to determine what additional mitigation might be necessary in the event of early termination, so the IA would provide for a dispute resolution process to assist the parties in determining the necessary mitigation at that time. In the event that this procedure fails to result in agreement of the parties, the Services would use standard enforcement tools to enforce that provision of the Permit. The bottom line for the resource is the Permit could not be terminated without the Services being "made whole" for incidental take occurring before Permit termination.

With regard to the provision allowing the company to seek Phase II of the Permit upon early termination of Phase I, it is important to note that Phase II would not take effect until completion of the dispute resolution process to determine any additional mitigation necessary for take that occurred during Phase I of the Permit. Further, in the event of early termination, the baseline for Phase II would be *the greater of* the amount of habitat projected to exist at the end of Phase I (i.e., 2045) or the amount of habitat existing at the time of Permit issuance. In this way, the provision of Phase II of the Permit would serve as a disincentive to early termination. Therefore, if in fact NRF habitat is harvested early in Phase I of the Permit and the the Applicant terminates Phase I, it would not only be liable for any additional mitigation necessary for take that occurred, but it would likely not receive the benefits of Phase II of the Permit for that habitat type.

C. Funding Assurances

Comment Summary:
The Puyallup Tribe of Indians suggested that a mitigation fund be mandatory. The Sierra Club-Cascade Checkerboard Project and a local organization asserted the funding assurances made by the Applicant as an IA issue are insufficient. The commentors suggested the Services be provided a first lien and deed of trust in the property covered by the HCP or other adequate security such as bonds. These reviewers also suggested that the company be required to notify the Services of any material events which may affect its ability to fulfill its obligations under the HCP.

Services' Response:
Before issuing an Incidental Take Permit (ITP), the Services must find that *"the applicant will ensure that adequate funding for the Plan will be provided."* This decision must be based on the information before the Services at the time the decision to issue the Permit is made. However, in light of the long-term Permit being contemplated here, and in response to these comments, the Services would revise the IA to provide for periodic financial status reports by the the Applicant to the Services to ensure notification of any material change in the Applicant's financial condition during the life of the Permit.

D. Liability

Comment Summary:
The Sierra Club-Cascade Checkerboard Project and a local organization suggested the IA provide a "hold harmless" clause in favor of the Services. The example given was in the context of damage to downstream property caused by flooding proximate to forest practices under the HCP.

Services' Response:
This is an interesting assertion, but probably inapposite here. As a practical matter, an ITP does not permit forest practices, it permits take of listed species under the ESA. Forest practices activities are regulated by the State, in a separate process. Thus, the Services cannot conceive of a situation, including the example given above, in which a cause of action against the Services, for damages proximate to the issuance of an incidental take permit, would arise.

E. Third-Party Involvement

Comment Summary: The Sierra Club-Cascade Checkerboard Project stated that although the HCP creates no rights for third parties, the HCP should clearly state that nothing in the HCP abridges the public's right to demand the Services enforce their rights under the HCP. A local organization commented that provisions should be made for the public to petition the Services for action.

Services' Response:
The Services note that nothing in the Implementation Agreement or Incidental Take Permit limits or affects the public's rights and recourse under the ESA.

F. Treaty Rights

Comment Summary:
The Muckleshoot Indian Tribe, Puyallup Tribe of Indians, Tulalip Tribes, and the Northwest Indian Fisheries Commission provided comments regarding the effects of the HCP on treaty fishing rights. Some commentors generally asserted the HCP inadequately addresses protection of treaty resources. The Puyallup Tribe of Indians largely incorporated the comments of the Northwest Indian Fisheries Commission by reference. The Northwest Indian Fisheries Commission specifically referred to the trust duty of the United States vis-a-vis these resources and the affected Tribes. This reviewer stated that the Services must prepare an analysis of how the HCP is consistent with the Federal government's trust responsibility towards treaty-protected resources, and suggested that treaty fishing rights may require protection in excess of minimum viability standards. The Muckleshoot Indian Tribe in particular commented that the HCP does not ensure the ability of Federal or Tribal involvement in the watershed analysis process. The Tulalip Tribes made the Services aware that the Tribe has ceded lands within the Planning Area. The Yakama Indian Nation and other Tribes also provided comments regarding various aspects of resource protection, which are addressed under the appropriate topical categories elsewhere in this document.

Services' Response:
The Services recognize the Trust responsibilities owed to Tribes concerning treaty resources. Effects to specific resources and protection therefrom, are addressed elsewhere in this document and appendices. The Services have specifically addressed the resources of concern to the Tribes in Sections 2.10.5.2, 2.11, 2.12, 2.13, 3.2.2.1, 3.3, 3.5.3.1 of the HCP, and Sections 2.1, 2.3, 2.7.6, 3.6, 3.8, 4.9, and 4.14.5 and 4.14.7 of the DEIS.

The Services believe that the Proposed HCP would increase the amount of protection these resources would receive when compared to proceeding under State Forest Practices Rules and Regulations, as would occur under the No-Action Alternative. The Services believe that the RHAs would provide better and larger buffers than would exist otherwise. Additional protections included in the Proposed Plan include accelerated watershed analysis, reduced road densities in certain areas, road-management BMPs, and aquatic monitoring with its attendant adaptive management. Current State regulations would provide smaller buffers on fish-bearing streams and little if any buffer on other perennial or intermittent streams. Also, the conservation measures of this HCP that are in addition to current State regulations would be provided immediately and before such measures would be required in the event an affected species is later listed for protection pursuant to the ESA. Greater detail is provided in response to comments addressing riparian/aquatic habitats and fish.

Beginning early in project development, the Services and the Applicant encouraged Tribal participation. Representatives of the Muckleshoot Indian Tribe and the Yakama Indian Nation participated in development of the Technical Paper on *Limiting Factors Analysis for Fish*. As the project continued, a representative of the Yakama Indian Nation peer-reviewed two Technical Reports, *Limiting Factors Analysis for Fish* and *Fisheries Strategy*. A representative of the Tulalip Tribes peer-reviewed the Technical Report, *Watershed Analysis*.

The Services and Applicant have discussed the HCP at forums attended by representatives from the Yakama Indian Nation, the Puyallup Tribe of Indians, and the Muckelshoot Indian Tribe. A presentation on the HCP was given to the Yakama Indian Nation. The Services have also utilized a cooperative agreement with the Northwest Indian Fisheries Commission to ensure the involvement of the affected Tribes in the HCP process. The Services gave several presentations to the Western Washington Cascades Provincial Advisory Committee and the Applicant addressed the Yakama Provincial Advisory Committee. Tribal representatives are active participants in both of these groups. Tribal representatives have been present on every Watershed Analysis Team conducted in the Planning Area and their continued participation is explicitly guaranteed by the HCP. To clarify this point, the following language has been inserted in the HCP: "For each prescription team assembled by the Applicant in the Planning Area, the Applicant would invite at least one representative from either the FWS, NMFS, WDFW, or local Tribe to participate on the team. In the event such representatives could not participate, a biologist with expertise in fisheries and watershed analysis would be required."

Finally, the final EIS clarifies that nothing in the proposed HCP, ITP, or IA is intended to limit the Services' Trust responsibilities to Native Americans. Further, consistent with Secretarial Order No. 3175, dated November 8, 1993, and the President's memorandum regarding Government-to-Government Relations with Native American Tribal Governments, published in the Federal Register on May 4, 1994, the Services are continuing to consult with the affected Tribes regarding this issue. If necessary, modifications to the Proposed Action would be considered following completion of such consultations.

G. Assurances (No Surprises) Policy

Comment Summary:

The National Audubon Society, Sierra Club-Cascade Checkerboard Project, Northwest Ecosystem Alliance, and 12 individuals provided comments on the No Surprises Policy. Some commentors, without referring specifically to the No Surprises Policy, questioned the formulation of the Unforeseen Circumstances, Extraordinary Circumstances, and Unlisted Species provisions of the Proposed Plan and agreement. Each of these topics are responded to as discrete topics elsewhere in this appendix. Other writers stated that the policy applies only where the HCP is designed to provide an overall net benefit and contains measurable criteria for biological success. Further, these commentors stated that this HCP was not qualified to receive the policy's assurances because one could not reasonably claim to provide a net benefit for all species named and unnamed and because it contained only habitat criteria and did not measure biological success. In addition, many took issue with the concept stated in the No Surprises Policy of seeking added mitigation from the Applicant only as a matter of last resort.

Services' Response:

The purpose of the No Surprises Policy is to provide assurances, consistent with Congressional intent, to nonfederal landowners participating in Endangered Species Act, Habitat Conservation Planning that no additional land restrictions or financial compensation would be required for species adequately covered by a properly functioning HCP, in light of Unforeseen or Extraordinary Circumstances. The ESA requires, among other things, that an HCP minimize and mitigate incidental take to the maximum extent practicable and that it not appreciably reduce the likelihood of the survival and recovery of the species in the wild. The "No Surprises" Policy provides for consideration of whether the HCP was designed to provide an overall net benefit to the affected species and whether the HCP contained measurable criteria for assessing the biological success as factors in determining if there are Extraordinary Circumstances that might warrant requiring additional mitigation from an HCP permittee. Although this would not preclude the Services from seeking additional mitigation from the Applicant for a particular species under Section 8 of the IA, the intent of this HCP would be to provide a net benefit to the ecosystems in the Planning Area over the No-Action Alternative, and thus generally a net benefit to the species dependent on these ecosystems. In this context, habitat targets would be considered to be measurable criteria for success.

The principle of seeking additional mitigation from a permittee only as a last resort, as embodied in the "No Surprises" Policy and Section 8 of the Applicant's IA, is consistent with the legislative history of section 10 which indicates Congressional intent that the Services provide adequate assurances to Permit applicants that long-term conservation plans will be adhered to, to provide sufficient incentives for the development of such plans. While Congress also mandated a process by which the parties would deal with Unforeseen Circumstances, there is no requirement that an applicant bear the full cost of any necessary additional mitigation. See comment summary and response for Unforeseen Circumstances and Extraordinary Circumstances.

H. *Level of Certainty/Uncertainty*

Comment Summary:

The Defenders of Wildlife, National Audubon Society, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, Washington Environmental Council, one local organization, and 20 individuals commented on the general issue of certainty. Most reviewers asserted the need for mutual

certainty in the ITP process. Some stated there was a high degree of uncertainty for the resource based on their review of the application package. A few individuals requested the Services build in a safety margin favoring the resources covered by the Proposed Plan. Finally, some commentors opined that the Applicant proposed to receive an inequitably high level of certainty under the Permit at the expense of the covered resources.

Services' Response:
Certainty is a value that is built into the section 10 permitting process. The Services understand, then, the appearance that one of the parties (i.e., the Applicant) to the process is a significant beneficiary of that process. Nevertheless, the Services believe that the certainty derived from engaging section 10(a)(1)(B) of the ESA is a "two-way street." In fact, and as demonstrated in the FEIS, management of the Applicant's land under the proposed HCP provides a far greater degree of certainty to the resources covered in the HCP than would exist proceeding under the No-Action Alternative. See also comment summary and responses for Forest Health, Forest Disease and Insect Infestations, and Fire and Windthrow.

I. Unforeseen Circumstances

Comment Summary:
The WDFW, Defenders of Wildlife, National Audubon Society, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, two local groups (one containing a petition), and 8 individuals discussed the Unforeseen Circumstances provisions of the Proposed Plan and the IA. Some reviewers pointed out that ESA implementing regulations require a conservation plan to state the procedures to be used to deal with Unforeseen Circumstances. Others stated generally, that flexibility should be induced into the Plan to deal with Unforeseen Circumstances. One reviewer stated the process fails if "landowners are not held responsible for future management alterations from Unforeseen Circumstances...." Another posited that a landowner must "rectify the impacts of the unforeseen circumstances to promote the survival and recovery of [a] species."

Several reviewers stated that Unforeseen/Extraordinary Circumstances must be limited to only those truly unforeseeable, and expressed the position that catastrophic and stochastic events such as fires may be unpredictable but are foreseeable. They stated that the HCP must include an analysis of the probability of such events and provide for a reasonable level of reserve habitat to mitigate for such events or a credible procedure to accommodate such events at that time. Some reviewers expressed concern that the IA limits the ability to compensate for external factors, such as catastrophic events or changes in management on adjacent federal lands. The Cascade Checkerboard Project stated that if such stochastic events were to happen later in the Permit period, it would be more devastating.

Services' Response:
The Congressional conference report accompanying section 10(a)(2) states that *"[i]t is . . . recognized that circumstances and information may change over time and that the original plan might need to be revised. To address this situation the Committee expects that any plan approved for a long-term permit will contain a procedures by which the parties will deal with unforeseen circumstances."* As a result, the implementing regulations provide that the conservation plan must specify *"[w]hat steps the applicant will take to monitor, minimize and mitigate such impacts, the funding that will be available to implement such steps, and the procedures to be used to deal with unforeseen circumstances . . ."*. 50 CFR 17.22(b)(1)(iii)(B) and 50 CFR 17.32(b)(1)(iii)(C)(2)). In addition, before issuing the permit the agency must find, among other things, that *"the applicant will ensure that . . . procedures to deal with unforeseen*

circumstances will be provided . . .". (50 CFR 17.22(b)(2)(iii) and 50 CFR 17.32(b)(2)(iii)).

The draft IA and HCP would provide procedures to deal with Unforeseen Circumstances. First, the HCP and IA would provide for modifications through watershed analysis and other forms of adaptive management. Such modifications could require additional restrictions on operations, and should minimize the likelihood that there will be Unforeseen Circumstances.

Second, Section 8 of the IA would describe the process to be followed if Unforeseen Circumstances arise. In enacting section 10(a)(2), Congress intended that the Services provide long-term assurances to a permittee that the terms of the plan would be adhered to and that further mitigation requirements would only be imposed in accordance with the terms of the plan. In light of this legislative intent, the Secretaries of Interior and Commerce established a "No Surprises" Policy (entitled "Assuring Certainty for Private Landowners in Endangered Species Act Habitat Conservation Planning") to guide implementation of the requirement that an HCP contain a mechanism to address Unforeseen Circumstances. Consistent with this policy, the IA would provide that the Services could seek further mitigation from the Applicant in cases of Extraordinary Circumstances. An Extraordinary Circumstance would be a material change in the circumstances or information that would warrant revising the Plan to avoid appreciably reducing the likelihood of survival and recovery of the affected species in the wild. If the Services determine that additional mitigation is required due to Extraordinary Circumstances, such mitigation would be provided on Federal land to the maximum extent possible. However, if the measures available on then-existing Federal land would be insufficient, the Services could seek additional mitigation from the Applicant. Consistent with the "No Surprises" Policy, such mitigation would not involve the payment of additional compensation or apply to parcels of land available for harvest or other uses without the consent of the Applicant.

With regard to the timing of stochastic events, the Services note that the Applicant accepts the risk of loss early in the Permit period should stochastic events occur. There is no provision in the Proposed Plan relieving the Applicant of its duty to mitigate should timber otherwise available for harvest be destroyed by fire. The next 10 to 20 years may be the most critical period. Later in the Permit period, the situation is quite different, as would be the landscape condition. The areas most prone to fires would be the subject of a cooperative landscape adaptive-management area. Hopefully, additional information will become available regarding methods to maintain owl habitat while controlling the risk of catastrophic fire. The Services believe that Federal and private land managers are anxious to implement such management.

The Services note that the dynamics of forest health are complicated. These complex systems are subject to “counter-intuitive” behavior. It appears that additional NRF habitat would provide a margin of safety, but some of these stands may also increase the risk of fire and could influence the spread of fire across the landscape. The Services believe there is yet much to learn in this regard and, therefore, reemphasize their support of cooperative landscape management, especially in the most fire-prone areas.

The Services further note that under the No-Action Alternative there is a distinct possibility that less NRF habitat would be available than under the Proposed Plan and the impact of a catastrophic fire under the No-Action Alternative, therefore, could be even more severe. The Proposed Plan offers greater certainty. In addition, should such circumstances require additional mitigation under this HCP to avoid appreciably reducing the likelihood of survival and recovery of a particular species in the wild, such mitigation would be provided for pursuant to section 8 of the IA. Also see Forest Health responses.

J. Extraordinary Circumstances

Comment Summary:
The WDFW, Defenders of Wildlife, Sierra Club-Cascade Checkerboard Project, one local group, and one individual provided comments on the Extraordinary Circumstances provisions of the agreement. Some reviewers expressed confusion as to what constitutes an "Extraordinary Circumstance." In particular, at least one reviewer stated that the standard should not be one of jeopardizing a species' population as a whole but should include serious population or habitat declines in the Planning Area. Several reviewers also expressed concern about the process for determining extraordinary circumstances. The WDFW and Defenders of Wildlife questioned why a Services finding of Extraordinary Circumstances would require peer review. The Defenders of Wildlife, Sierra Club-Cascade Checkerboard Project, and one local organization questioned why the Government must bear the burden-of-proof in making a determination of Extraordinary Circumstances or stated that the level of proof is too high. This view expressed concern that Plum Creek could tie such a finding up in courts for years, after exhaustive dispute resolution procedures. One commentor suggested that, if a finding of extraordinary circumstances is made, Plum Creek should defer planned activities until additional mitigation can be secured. The Sierra Club-Cascade Checkerboard Project asked who would pay for needed mitigation and stated that stochastic events should not be "external" factors.

Services' Response:
Extraordinary Circumstances is defined at Section 2.5 of the draft IA (HCP Appendix 10) as a material change in circumstances or information that warrants revising the HCP or Safe-Harbor Baseline, and requiring further mitigation from the Applicant to avoid appreciably reducing the likelihood of survival and recovery of the affected species in the wild. This standard would essentially be the same as that contemplated in section 7(a)(2) and section 10(a)(2)(B)(iv) of the ESA. Consistent with the "No Surprises" Policy, in making a determination of Extraordinary Circumstances the Services would consider factors such as the size of the current range of the affected species; the percentage of the range adversely affected by the HCP; the percentage of the range conserved by the HCP; the ecological significance of that portion of the range affected by the HCP; the level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether the HCP was originally designed to provide an overall net benefit to the affected species and contained measurable criteria for assessing the biological success of the HCP. The standard would be applied on a case-by-case basis, taking into account the particular needs of and the severity and immediacy of threats posed to a species. In response to the commentor who suggested that the standard should not just be jeopardy to the species' population as a whole, it may be instructive to note, as the preamble to the section 7 implementing regulations noted (at 51 Federal Register 19934), that the concept of "survival" varies widely among listed species and can mean retention of a sufficient number of individuals and/or populations with necessary habitat to insure that the species will keep its integrity in the face of genetic recombination and known environmental fluctuations.

As to the placement of the burden of proving the existence of Extraordinary Circumstances, the IA would be consistent with the No Surprises Policy which states that the Services shall have the burden of demonstrating that such Extraordinary Circumstances exist, using the best scientific and commercial data available. That the Services have the burden-of-proof in this matter would be consistent with the fact that the Services have the burden of proving the necessity to amend a permit under Permit Administration Regulations. (See 50 CFR 13.23.)

The "No Surprises" Policy also states that a finding of Extraordinary Circumstances must be clearly documented and based upon reliable technical information regarding the status and habitat requirements of the affected species. Consistent with this and the Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities (59 FR 34270), the Services would provide for peer review of the scientific data on which a finding of Extraordinary Circumstances is based. This would be consistent with the general mandate found throughout the ESA and in the "No Surprises" Policy to use the best scientific data available in decision-making under the Act. However, peer review would be requested only on the data, not on the Services' conclusion of Extraordinary Circumstances. Furthermore, in response to the concerns that the requirement for peer-reviewed information would make it difficult find Extraordinary Circumstances in a timely manner, the IA would provide that if peer-reviewed information is not available in time for the Services' to meet their obligations under statute, regulation, or the IA, a finding of Extraordinary Circumstances would be made without peer-reviewed data, although it may be subject to reconsideration if such information becomes available.

With regard to the concern that the Applicant could submit a finding of Extraordinary Circumstances or the requirement of additional mitigation to dispute resolution, and then litigate the issue, Section 14 of the IA would provide that the Services specifically reserve the right to use whatever enforcement powers and remedies are available by law or regulation, including but not limited to suspension or revocation of the Permit.

Finally, with regard to the suggestion that the Applicant should defer its activities in the event of Extraordinary Circumstances, the Services would propose to clarify the IA by adding a provision that the parties will use their best efforts to avoid contributing to the situation that has given rise to such circumstances during the period necessary to develop and implement any necessary additional mitigation.

K. Unlisted Species Agreement

Comment Summary:
At least seven reviewers, including the Northwest Indian Fisheries Commission, Northwest Ecosystem Alliance, Sierra Club-Cascades Checkerboard Project, Washington Environmental Council, two local organizations, and one individual (plus 424 preprinted cards), provided comments on the proposed use of an agreement covering unlisted species. In general, these reviewers suggested that only those species which have been adequately analyzed should be included in any agreement, that such analysis requires full population studies and demographic analyses, and that the agreement must exclude species without adequate habitat and range analysis. In this view, species not identified by name in this plan should not be added to the permit without a full evaluation at the time of listing. One commentor stated that the DEIS should discuss limitations in the knowledge base in order to assess whether the provision in the IA regarding currently unlisted species should remain or be narrowed.

Services' Response:
First, Congress intended that unlisted species agreements be available to applicants completing conservation plans under the ESA. The conference report to the 1982 amendments to the ESA states:

> *In enacting the Endangered Species Act, Congress recognized that individual species should not be viewed in isolation, but must be viewed in terms of their relationship to the ecosystem of which they form a constituent element. Although the regulatory*

mechanisms of the Act focus on species that are formally listed as endangered or threatened, the purposes and policies of the Act are far broader than simply providing for the conservation of individual species or individual members of listed species. This is consistent with the purposes of several other fish and wildlife statutes (e.g. Fish and Wildlife Act of 1956, Fish and Wildlife Coordination Act) which are intended to authorize the Secretary to cooperate with the states and private entities on matters regarding conservation of all fish and wildlife resources in the nation. The conservation plan will implement the broader purposes of all of those statutes and allow unlisted species to be addressed in the plan.

. . . In the event that an unlisted species addressed in an approved conservation plan is subsequently listed pursuant to the Act, no further mitigation requirements should be imposed if the conservation plan addressed conservation of the species and its habitat as if the species were listed pursuant to the Act.

Consistent with this Congressional direction, the Applicant seeks to conserve the ecosystems on which species depend. By addressing all possible habitat types that exist in the Planning Area, and by association all species that use those habitats, the Applicant seeks to provide mitigation for all vertebrate species that may use the Planning Area. This is similar to the precedent set in the Murray-Pacific multi-species HCP amendment (1995). However, in this case, Lifeforms were used to more clearly demonstrate the link between species and their habitats. The Services used a combination of stand-structure, special-habitat, and species-specific provisions to adequately address vertebrate species. The Services acknowledge that more data is available for some species than is available for other species. This is one of the reasons that the habitat-based approach is used. FWS Region 1 Guidelines for Determining Covered Species Lists and Assurances Relative to Habitat Conservation Planning and the Department of Interior and Department of Commerce Policy on No Surprises: Assuring Certainty for Private Landowners in Endangered Species Act Habitat Conservation Planning are contained in Appendix 4 of the HCP.

Second, the Implementation Agreement would provide for a subsequent review before a species would be added to the Permit. If a previously unlisted species is proposed for listing or becomes listed, Section 7.1 of the IA would provide for notice by the Applicant of its desire to add the species to its Permit and a review by the Services to consider any new information, including information that is developed during the rulemaking process on the proposed listing, before determining whether the species could be added to the Permit. If adding the species would result in appreciably reducing the likelihood of the survival and recovery of the affected species in the wild, the Extraordinary Circumstances provision of the IA would be triggered. If additional mitigation could not be provided under the terms of this provision, the species would not be added to the Permit. In addition, the review period would enable the Services to fulfill their responsibilities under sections 7 and 10 and other applicable provisions of the ESA.

L. Multi-Species Approach

Comment Summary:
The North Cascades Conservation Council, Northwest Ecosystem Alliance, four local organizations, and 43 individual letters, as well as 424 preprinted cards opposed the multi-species, habitat-based approach used by the Services. These organizations recommended instead that full populations studies be performed on each species to be covered by an unlisted species agreement, that population projections be made for

each such species, that range and occurrence maps be provided for each species, and that the individual habitat requirements of each species be fully described and discussed in relation to the Plan and its alternatives. Many commentors only cited one or few of the above recommendations; others merely stated they believed the approach used was insufficient or inadequate. The Sierra Club-Cascade Checkerboard Project did not oppose the multi-species approach but stated they have serious concerns for its use in the HCP and believe the approach only works if certain criteria are met. One individual supported the ecosystem and habitat approach over a species-by-species approach. The Washington Forest Protection Association supported the use of the multi-species approach.

Services' Response:
The Services believe that a multi-species approach is not only appropriate but is encouraged in the ESA (H. Rep. No. 835, 97th Cong. [1982]). The Services believe that the habitat-based analysis as conducted in the Murray-Pacific HCP Amendment (1995) is an appropriate analysis. The Applicant's HCP further refined this approach through the use of Lifeforms. Lifeforms are an accepted means of guilding (Brown 1979). Several modifications to Brown's Lifeforms were made to more rigorously incorporate the needs of habitat specialists. In addition, delays were incorporated for some habitats to accommodate the lack of snags and residual trees in recent harvest units. To further ensure that habitat specialists are being adequately addressed, special habitats (e.g., caves, talus, wetlands) have been given specific attention. Also, the amounts of the eight stand structures available in five coniferous forest types and in deciduous forests have been analyzed as well and depicted in Table 30b. The Services believe that common-sense dictates that 285 named species, and certainly unnamed species, cannot be addressed one at a time. Instead, logistics demand some form of association or guilding. The Services believe the methods used are appropriate. The Services further note that species-by-species assessments were used for Species of Concern and where primary habitat amounts were extremely limited for a given Lifeform.

M. Amendments

Comment Summary:
The Northwest Indian Fisheries Commission commented on several aspects of the proposed amendment process. The WDFW, the Sierra Club-Cascade Checkerboard Project, five local organizations, and 24 individuals (two comments on preprinted cards) suggested the amendment process be used to review and revise the Plan or its implementation on a routine schedule. Some reviewers suggested every modification be subject to some form of public process, including a provision for the public to petition the agencies for action and a requirement that all proposed modifications be subject to peer review. One reviewer expressed concern that even minor modifications can have unforeseen consequences and cumulative effects that may have a material impact on the HCP. In addition, reviewers expressed concern that: (1) any commercial development or activity unrelated to timber harvest activity should require formal amendment; (2) according to the HCP, changes in the conduct and flexibility of Plum Creek's operations such as harvest timing, harvest location, and application of silvicultural techniques would not require formal amendment; and (3) according to the HCP, frequency and scope of monitoring may be changed without formal amendment. Finally, one reviewer expressed concern that the establishment of new Lifeform projections could be accomplished as a minor amendment, and that the HCP would allow Plum Creek to miss stand structure projections by twenty percent before mandatory evaluation. That reviewer suggested that any significant decline in the population of a Plan Species should trigger reevaluation of minimum habitat requirements.

Service's Response:
The HCP contains provisions for monitoring and reporting on a routine schedule (HCP Table 31). The HCP section on Adaptive Management (HCP Section 5.4) explains how this information will be used to make adjustments through adaptive management. If other modifications to the mitigation program are warranted, the Services would initiate such changes pursuant to Sections 7.3.2 or 7.1.1 of the IA and applicable regulations, consistent with the IA provisions regarding Unforeseen and Extraordinary Circumstances. The amendment process is described at Section 7 of the IA. Nothing in that section precludes further or continuing review of mutually agreed amendments to the Proposed Plan.

All amendments, except minor modifications and certain land transactions conditioned so as to not compromise the effectiveness of the HCP would be subject to public review and comment at the time they are considered. The provision for minor modifications to the HCP is discussed in Section 7.3.2 of the IA, and would include such things as minor modifications to the mitigation program as discussed in Section 5.3.5 of the HCP, changes in reporting requirements, correction of typographical errors, and map corrections. It is important to note that minor modifications would be subject to a 60-day review period by the Services, during which time the Services may disapprove the change or provide notice that the proposed modification must be processed as a formal amendment if the change would be material. The limited provisions for land transactions without formal amendment are discussed above, and would contain provisions to ensure that the HCP would not be compromised and to avoid material cumulative effects. Nothing in the IA would preclude the public from notifying the Services of changes they believe to be necessary. Neither would the IA preclude the Services or the Applicant from obtaining peer review on a proposed change if appropriate.

The Services agree that coverage for any commercial development or activity unrelated to timber harvest activity that would require an ESA Incidental Take Permit would necessitate a formal amendment of this Permit. The HCP only analyzes the effects of timber harvest and related land use activities. See Section 1.1 of the HCP and Section 1.8 of the IA.

With regard to specific concerns regarding changes in the conduct of Applicant's operations such as harvest timing and location and application of silvicultural techniques as minor modifications, unless otherwise specifically limited by deferrals, special habitat prescriptions, or similar limitations expressly defined in the HCP, harvest timing and location, road construction timing and location, and other operational decisions such as placement of yarding corridors across streams remain at the discretion of the Applicant. Any such change, beyond those provided for in the HCP as operational flexibility for the Applicant or adaptive management, would be subject to prior review by the Services with the opportunity to disapprove it or to initiate a formal amendment process if such change would be material.

With regard to specific concerns regarding the establishment of new Lifeform projections or changes in the frequency and scope of monitoring, Again, any such change would be subject to prior review by the Services with the opportunity to disapprove it or to initiate a formal amendment process if necessary.

N. Adaptive Management Techniques

Comment Summary:
The EPA requested additional response be incorporated into the Plan as a result of aquatic monitoring findings. The WDFW suggested that the results of amphibian monitoring be included in the adaptive

management process and that a more conervative "trigger level" be used for owls and corrective measures In addition, the WDFW disagreed with the link between adaptive management and "administrative determinations by regulatory agencies" and they stated that corrective action should be taken prior to a administrative determination. The Sierra Club-Cascade Checkerboard Project indicated that the adaptive approach in the Plan is a one-way approach which only benefits the Applicant, should include measurable criteria for triggers, and that adaptive changes should be peer reviewed. The Puyallup Tribe of Indians requested clarification and the Northwest Indian Fisheries Commission questioned how NEPA and SEPA would be accommodated. Two individuals recommended the use of monitoring and corrective feedback, particularly for owls. An individual remarked on the lack of adaptive management for other birds. One individual suggested a complete review at 25 years and another suggested setting 10-year targets. One individual indicated that they supported the adaptive approach. A professor in the College of Forest Resources at the University of Washington, supported the adaptive approach and said it was good to continue to learn from the management actions.

Services' Response:
In discussions with the EPA, it was discovered that they were unaware of the basic premise of adaptive management as it was to be applied in this Plan. The results of the aquatic monitoring and the results of watershed analysis monitoring would be used to assess and modify the treatments being conducted. Where deficiencies are identified they would be corrected. There were no limits placed on the level of mitigation which may be provided with regard to watershed prescriptions.

The results of amphibian monitoring would be factored into the design of riparian buffers. At the present time, it is uncertain exactly how this would be accomplished. This uncertainty is part of the adaptive process. Perhaps one of the most unique components of the HCP is the inclusion of the concept of adaptive management. In the HCP, many components of adaptive management (e.g., owls) may have an upper limit beyond which further mitigation would not be mandatory. Other components (e.g., watershed analysis) have no such limit.

Because the adaptive management process and bounds have been described for public review and comment in these documents, actions which fall within these bounds would not be subject to further NEPA review. The Services note that there are a number of periodic reports due during the course of the Plan. Each of these reporting times, and at any time in between, allows an opportunity for review and suggested changes by either the Services or the Applicant. The Services believe that adaptive management offers viable solutions to management concerns when insufficient information is available at present upon which to develop intelligent strategies.

The triggering level for corrective measures regarding owls is believed to be appropriate be the Services. All projections are expected to vary somewhat due to natural variations and too narrow a margin for such variation is impracticable. Additional details regarding owl monitoring methods have been added to the HCP. The Services and the Applicant agreed that the link between adaptive management-based corrective action and "administrative determination" was unnecessary and have removed that language from the HCP.

O. Permit Enforcement, Suspension, or Revocation

Comment Summary:
The Sierra Club-Cascade Checkerboard Project and a local organization suggested the agreement include penalties for non-compliance exclusive of court action, such as a power to foreclose on a deed of trust,

forfeiture of a surety bond, or authority to assess incidental and consequential damages. One of these reviewers also stated that it was crucial that the Services not waive any remedy or enforcement option.

Services' Response:
The ESA and its implementing regulations provide mechanisms to enforce the Permit with respect to listed species, including provisions for suspension and revocation of the Permit and civil and criminal penalties. The IA would not waive any of these enforcement tools; in fact it clearly recognizes that these remedies would remain available. Furthermore, the IA would provide that early termination of the Permit either by the Services or the Applicant would be subject to compliance with the Permit condition requiring that any past incidental take has been sufficiently mitigated. In addition, the assurances provided by the "No Surprises" Policy and Section 8 of the IA would be contingent on the Applicant's compliance with the terms of the IA, the Permit, and the HCP.

P. Law Enforcement

Comment Summary:
The Defenders of Wildlife, Northwest Ecosystem Alliance, Checkerboard Project, and two individuals questioned the Services' law enforcement commitment following Permit issuance. One individual on a preprinted card suggested that funding be provided for enforcement.

Services' Response:
The Services' enforcement duties under the ESA would not be abrogated by the Proposed Action or the underlying Implementation Agreement. The Services would continue to enforce the ESA on all lands whether covered by the HCP or not. See the Response for Funding and Monitoring.

Q. Termination Clause

Comment Summary:
The Northwest Indian Fisheries Commission and the Checkerboard Project expressed the belief that the Applicant, but not the Services, is able to easily terminate the Permit. One of these reviewers expressed concern that, since the early reduction of NRF habitat was allowed, Plum Creek could terminate the Permit after achieving its benefits with little consequence, and even avail itself of the "Safe Harbor" provision. The other reviewer stated that Plum Creek's obligations at termination should be clearly defined, particularly regarding what constitutes sufficient mitigation. At minimum, the reviewer states, the Company should be required to provide a complete termination report and commit to conduct whatever mitigation may be necessary to comply with the HCP. Furthermore, the reviewer suggested that all renewal options and the "Safe-Harbor" provision should terminate if the Company elects to terminate the Permit early or the Services terminate because of Plum Creek's substantial noncompliance.

Services' Response:
The IA would recognize the Applicant's right to terminate the Permit consistent with existing regulations. However, it also would explicitly mandate a termination report and compliance with the Permit condition requiring that any past incidental take has been sufficiently mitigated. It would be impossible at the time of Permit issuance to determine what additional mitigation might be necessary in the event of early termination, so the IA would provide for a dispute resolution process to assist the parties in determining the necessary mitigation at that time. In the event that this procedure fails to result in agreement of the parties, the Services would use standard Permit enforcement tools to enforce that provision of the Permit. The bottom line for the resource is the Permit could not be terminated without the Services being "made

whole" for incidental take occurring before Permit termination.

With regard to the provision allowing the Applicant to seek Phase II of the Permit upon early termination of Phase I, it is important to note that Phase II would not take effect until completion of the dispute resolution process to determine any additional mitigation necessary for take that occurred during Phase I of the Permit. Further, in the event of early termination, the baseline for Phase II would be *the greater of* the amount of habitat projected to exist at the end of Phase I (i.e., 2045) or the amount of habitat existing at the time of Permit issuance. In this way, the provision of Phase II of the Permit would serve as a disincentive to early termination. Therefore, if in fact NRF habitat is harvested early in Phase I of the Permit and the Applicant terminates Phase I, it would not only be liable for any additional mitigation necessary for take that occurred, but it would likely not receive the benefits of Phase II of the Permit for that habitat type.

R. Safe-Harbor (Phase II) Provision

Comment Summary:

The Puyallup Tribe of Indians, the Northwest Indian Fisheries Commission (2 letters), the Defenders of Wildlife, National Audubon Society, Environmental Defense Fund, Northwest Ecosystem Alliance, Checkerboard Project, three local organizations (one with a petition containing 82 signatures), and two individuals submitted their observations on the implementation of the "Safe-Harbor" concept. Several issues were raised and are discussed separately below:

Comment: Among the commentors was Attorney Michael Bean of the Environmental Defense Fund, a proponent of the "Safe Harbor" concept. Mr. Bean stated that, while probably a semantic observation, he would prefer the Services not refer to the second 50-year phase of the proposed plan as the "Safe Harbor Phase." Bean asserted that the second 50 years lacks ongoing voluntary activities that could result in increased utilization of the plan area by listed species, and that the Applicant does not commit to any future beneficial actions not otherwise required by law. Instead, he suggested that this is a 100-year Permit with two phases with differing substantive requirements.

Services'Response: The Services agree that regardless what it is called, this would be a 100-year Permit with two phases, and should be analyzed as such. The Final EIS clarifies this point. Further, to avoid any confusion, the Services agree that the term "Safe-Harbor Phase" should not be used in the context of this Permit, but instead, the second 50-years should be referred to as "Phase II." However, it should be noted that habitat amounts which would exceed the baseline would be completely voluntary and the minimization and mitigation actions to be conducted exceed those which would otherwise be required.

Comment: Several reviewers took issue with the baseline for Phase II of the Permit. One writer stated that it was unclear what the baseline is. Other reviewers expressed concern that the baseline could be 90 percent of projected habitat conditions at the end of 50 years and they assert the baseline should equal 100 percent of the initial habitat quality at the inception of the HCP.

Services' Response: The HCP proposes that the baseline for Phase II would be the amount of habitat projected to exist at year 50 if the 50-year Phase I is completed (i.e., 2045). In the event that Phase I is terminated early, the baseline for Phase II would be the greater of the amount of habitat projected to exist at year 50 or the amount of habitat existing at the time of Permit issuance. The baseline is clarified in the FEIS in response to this comment. The minimum habitat amounts required of the Applicant reflect

the flexibility provided in the HCP to operate within an acceptable range for all of the stand-structure categories. The 90 percent figure reflects what the Services agreed was an acceptable level of variability in the projected quantities of habitat. The explanation for the stand-structure flexibility can be found in Section 5.3.5.

Amendments and Flexibility. The Services believe that the Safe-Harbor baseline would be best set at the highest level possible, and therefore did not select solely the initial habitat amount.

Comment: At least two reviewers expressed concern about what they characterized as significantly diminished monitoring and reporting requirements during Phase II of the Permit.

Services' Response: The concept of a "Safe-Harbor" is the amount of habitat provided that would equal or exceed the amount which would otherwise be required. This concept is based on the belief that greater amounts of habitat are beneficial for the affected species. This is similar to the habitat-based approach used throughout the HCP. The Services do not believe that the level of monitoring and reporting is diminished, instead, the Services believe the HCP is appropriately augmented with additional monitoring requirements at the necessary times. For instance, a considerable amount of owl monitoring occurs in the first 20 years. This is addressed in greater detail in responses to *Monitoring* and *Reporting*. In addition, the Services note that a considerable amount of monitoring and reporting would continue throughout Phase II. Reports would continue to be provided on a decadal basis and would contain estimates of stand structure amounts, results of watershed monitoring, and summaries of significant actions.

Comment: One reviewer expressed concern that the provisions for Phase II did not adequately address the question of habitat reduction by Plum Creek in the event of early termination and questioned whether the Company would terminate early and be relieved of additional monitoring and other requirements applicable to the First Phase of the Permit and then avail itself of Phase II of the Permit. Another reviewer recommended that there be no Phase II upon early termination of Phase I by Plum Creek. Some reviewers stated that Phase II of the Permit effectively exempted the applicant from any additional responsibilities to accommodate unlisted species.

Services' Response: If the Applicant terminates Phase I of the Permit prior to the end of the first 50 years, the baseline for Phase II would be the greater of the amount of habitat projected to exist at year 50 or the amount of habitat existing at the time of Permit issuance. This should serve as an incentive for the the Applicant to complete implementation of the first phase. Phase II would be in effect only as long as baseline conditions are met for specific habitat types. Maintenance of these baseline conditions would be expected to continue to benefit unlisted, as well as listed, species. Should unlisted species become listed during either phase of the Permit, they would receive additional protection as described in Section 5.0 of the HCP.

Comment: Some writers took general issue with the concept of Phase II and questioned whether it should be used here at all. One such writer referred to it as a "corporate subsidy" and a "license to destroy habitat for 100 years." At least two writers suggested that, as an alternative, there be a framework established for renewal of the Permit.

Services' Response: The purpose of the second phase of the Permit would be to reduce the incentive of the Applicant to purposefully limit the utilization of the Planning Area by listed species at the end of the first 50 years. The Services believe that implementation of the HCP may result in increases in populations of listed species on its lands, particularly if more or better habitat for listed and unlisted species is voluntarily provided in the Planning Area than was projected at the outset. If so, the incentive for the Applicant, absent any special provisions, would be to reduce habitat to levels projected for the end of the Phase I, particularly if Federal law at that time provides that habitat modification or disturbance

may be a form of incidental take of listed species. The Services believe that it is in the best interest of the the Applicant and listed species to have a positive incentive to attract and maintain species and to improve wildlife habitat during and beyond Phase I of the HCP.

In addition, there would be safeguards built into the process designed to ensure that listed species remain adequately protected during Phase II of the Permit. These safeguards include a review by the Services with the option of adjusting the Phase II baseline and providing guidance regarding methods to minimize incidental take, or finding that Phase II is not available for a certain species because it would appreciably reduce the likelihood of the continued survival and recovery of that species.

IX. OTHER PLAN ELEMENTS

A. Phase-In Implementation

Comment Summary:

Although no specific comments were received on this topic, one individual remarked that the Plan should be more conservative during the first few decades and then, in later years, it could be relaxed. This comment summarized the sentiment found, but not explicitly stated, in many additional comments.

Services' Response:

The Services agree with the concept of this comment and believe that sufficient safeguards are necessary during the early implementation of the HCP. Owl deferrals and RHA minimums and interims play an important role in this regard. The Services have also ensured that adequate amounts of monitoring and reporting would occur early in the Permit period.

B. Inventory and Surveys

Comment Summary:

The Sierra Club-Cascade Checkerboard Project commented that monitoring schedules should be tied to road building, timber harvesting, and other activities disturbing drainages and watersheds. Two individuals commented that they felt the description of monitoring protocols is insufficient for evaluation. A number of commentors addressed population surveys and studies in the context of the Unlisted Species Agreement. Those comments are summarized and addressed in that section and in the response to Research below.

Services' Response:

The monitoring schedule summarized in Table 31 of the HCP (as revised), was established to ensure timely reporting of the impact of all of the Applicant's commercial forest management activities. The reporting periods are more frequent during the first 20 years of the Permit period in recognition of the change in conditions projected in the earlier years. The activities scheduled during the first 20 years would set the stage for habitat conditions throughout the Permit period. Monitoring protocols would be determined at the time of the activity to utilize the best methods available to accommodate site-specific conditions and ensure achievement of the monitoring objectives.

C. Research

Comment Summary:

The WDFW, Yakama Indian Nation, a professor at the University of Washington, and six individuals (two comments on preprinted cards) commented on research aspects of the HCP. Comments included that future research from HCP measures should be peer reviewed, urged that additional research be

conducted for species listed in the future to determine if additional mitigation measures are required, new information should be accommodated into changes of the HCP when measures prove faulty, the HCP is based on inadequate science or is insulated from future science, and support for Plum Creek's past contribution in collecting credible scientific data as part of monitoring and research programs. One commentor suggested that bird survey research to verify Lifeform designations is less important than evaluating species responses to changes in their environment and urged for surveys of other types of animals. More detail was requested on the design of amphibian surveys.

Services' Response:
The intent of research described in HCP Section 5.4.4 is to address ecosystem management questions and HCP elements as testable hypotheses which can be investigated with the Forest Service and other cooperators. The two venues for this research are: (1) reports to the Services during the Permit period, and (2) peer-reviewed publication of results by graduate students or principal investigators. As discussed under Adaptive Management (HCP Section 5.4.2), information from research would be used to determine if additional mitigation measures are required during the Permit period, as requested by commentors. The emphasis of the research and monitoring plan for the HCP was to track and evaluate **habitat**, rather than the biology of all species occupying the Planning Area. The Services felt that little would be gained from estimating populations if details on habitat condition and trends were lacking. Verification of Lifeform association with forest structure stages is a fundamental element of the research and monitoring program. Concerns for how Lifeform species are affected by silviculture in these structural classes can be indirectly addressed. Details on survey layout and design for amphibians and other groups were not specified at this time, pending additional discussions with researchers and statisticians.

D. Databases Used/Created

Comment Summary:
The Sierra Club-Cascade Checkerboard Project commented that they felt the database contained errors and omissions, such as out-of-date ownership maps and roaded lands not showing all unroaded areas. The Washington Environmental Council commented that GIS analysis of large tracts of land must be accompanied with good ecological information to serve as a workable tool. One individual felt Plum Creek should evaluate the success of spotted owls protection based on numbers of owls on their lands only. One individual commented that he did not like the scale of the maps used in the HCP and DEIS. One individual on a preprinted card commented that there is inadequate information now to assess impacts.

Services' Response:
The Applicant utilizes a Stand Level Inventory System which is updated annually with data related to timber stands, roads, and other commercial forest-management-data needs. A request was made for inventory information from the Forest Service, but the information received was either incompatible with the Applicant's database or incomplete. As a result the Applicant utilized photo interpretation techniques to establish stand types on Federal lands and then the Applicant extrapolated from it's own database to build a comparable set of information on other ownerships. For this reason, the information possessed by the Applicant may vary from other sources of information but the amount of variance is expected to be minimal and thus, would not materially impact the programmatic approach of the analysis conducted for the HCP. Additionally, provisions have been made under Section 5.3.5 of the HCP to facilitate information updates. A detailed ecological analysis for the Planning Area is contained in Technical Report No.7 (Ecological Classification of the HCP Project Area). The scale of the maps used

for the HCP was selected to allow inclusion of the maps in the HCP. Larger-scale maps would have been cost prohibitive and large-scale distribution of the maps to the public would not have been possible. Regarding the issue of inadequate information, see the response to Monitoring, Adaptive Management, Amendments, Level of Flexibility, and Research.

E. Predictions/Models and Sensitivity Analysis

Comment Summary:

The Yakama Indian Nation commented that the models used in the HCP are too optimistic. The National Audubon Society commented that to use an unproven population simulation model (RSPF) to "monitor" the success of the HCP is a cause for concern. The Sierra Club-Cascade Checkerboard Project and one individual suggested that Plum Creek's modeling of wildlife habitat is flawed because there is no attempt to predict populations of species, only habitat, they feel FIBRPLAN and RSPF models contain uncertainties and/or have not yet been validated. The Northwest Ecosystem Alliance commented that Plum Creek needs to field test its population simulation models. The Washington Environmental Council commented that Plum Creek should incorporate stochastic events in the simulation models. One local organization suggested that the models are too simplistic to work in the Planning Area. One individual commented that the models used in the HCP have never been tested and that many variables (note: no examples were given) are missing.

Services' Response:

The emphasis of the research and monitoring plan for the HCP is to track and evaluate **habitat**, rather than the biology of all species occupying the Planning Area. The Services felt that little would be gained from estimating populations if details on habitat condition and trend were lacking. There currently are no "proven" models for spotted owl populations. Six other methods and models to estimate "impact" of timber harvest on owl sites were tested in the Planning Area and discarded by the Services (see Irwin and Hicks 1995, Technical Report No. 6). The RSPF model would be evaluated with density monitoring in the Planning Area and by applying the model to other landscapes in the area (e.g., larger Wenatchee National Forest owl population area). The Services believe that HCPs can include and incorporate models and concepts that may be empirically derived or "untested" outside of the Planning Area. Examples include dispersal habitat definitions in the Murray-Pacific HCP and definitions for "take" around spotted owl sites in the Simpson HCP. The Services believe that implementation of HCPs with these innovative features provide opportunities to learn by experimentation, with provisions for corrections if protection is found to be inadequate or ineffective. In response to concerns about the lack of modeling to "simulate" catastrophic forest disturbance, the Applicant consulted silviculturists and fire ecology experts. The consensus from these experts was that modeling would not be productive, because effects to wildlife would differ dramatically depending on when and where disturbances were modeled to "occur". For instance, a fire in Forest Service Matrix areas would have a different impact on owl habitat than a large-scale fire in Federal Late-Successional Reserves. Models used in development of the HCP were incorporated from other planning documents (e.g., HCPs, forest plans) or were developed and derived with data from the Planning Area. Consequently, the models are not viewed by the Services as being "untested" or "optimistic". See also Response to Spotted Owl - Population Impacts for further discussion of the use of the RSPF spotted owl model.

F. Monitoring

Comment Summary:

The Northwest Indian Fisheries Commission commented that the HCP should increase monitoring for

water quality parameters. The WDFW and Sierra Club-Cascade Checkerboard Project commented that the monitoring program was either inappropriate or inadequate for assessing species responses to various forest practices, and they suggested that monitoring should be increased. The WDFW recommended the owl model be evaluated by systematic owl monitoring conducted at least three times or each ten years (two out of three years each time). The Sierra Club-Cascade Checkerboard Project also stated that measurable wildlife criteria in the HCP should not just be monitored for compliance, but also for effectiveness. One local organization commented that the monitoring emphasis should be on measurable criteria. Another local organization requested additional monitoring. One individual in the College of Forest Resources at the University of Washington commented that the "incorporation of significant monitoring and research is also very appropriate to the adaptive management philosophy as well as a specific contribution to the Snoqualmie AMA." One individual commented that the HCP must be monitored carefully so that the actual status of plants and animals can be ascertained and the Plan revised if necessary. Another individual suggested that Plum Creek should monitor in-stream flow to determine the upstream and downstream requirements for salmonid passage. One individual on a preprinted card suggested that fish habitat along the Cle Elum River be monitored. One individual complained that the HCP did not include any description of plans to continue surveying owl populations to verify that the Plan is working. Two individuals commented that they felt the description of monitoring protocols is insufficient for evaluation. Specifically, they feel the following should be addressed:

1) What is the response variable to be monitored?
2) What is the minimum difference in the response variable deemed biologically important?
3) What is the level of significance to be used?
4) What is the estimated variance associated with the response variable?
5) What test would be used and what would its power be to detect the minimum differences desired?

One individual commented that monitoring was left too much in the hands of Plum Creek, and another individual commented that should the one who has the most to gain be the one to write the rules and also be expected to turn themselves in if the rules are not followed?

Services' Response:
Monitoring will be used to verify that stand and landscape objectives and specific prescriptions have been met. Research and monitoring for purposes of adaptive management is part of the HCP and they are discussed in HCP Section 5.4.3. Cooperative research and monitoring programs are desired by the Applicant (see HCP Section 5.4.3.4). The monitoring programs in the HCP are designed to evaluate habitat amounts and conditions in the Planning Area rather than species' populations. This is appropriate in the Services' opinion since there are many independent variables that occur outside of the Planning Area. These variables are outside of the control of the Applicant, but they nevertheless can influence species population levels. The most appropraite course of action for the Applicant is to provide the habitat upon which these species depend. Monitoring of the effectiveness of spotted owl deferrals and RSPF model validation would evaluate spotted owl habitat and population predictions during the Permit period (see FEIS, Appendix 4, Section 5.1.2). The Services believe more monitoring is needed than what WDFW suggested, particularly during the earlier years of the Plan. Additional details regarding the owl monitoring program would be determined through discussion with the Services at the initiation of the program. Measurable criteria for a host of mitigation measures are presented in HCP Section 3.6. The objective of the spotted owl monitoring program is not for compliance but instead for the effectiveness of the mitigation measures. Monitoring of water quality parameters would be conducted through

watershed analysis and reevaluations would occur on a regular schedule (see HCP Table 31). Aquatic resources monitoring (e.g., temperature) is another example of a measurable criteria that would be monitored for mitigation measure effectiveness rather than compliance to specific targets. Forestry typically has little effect on minimum instream flows and if anything increases those flows. Standard road construction practices of the Applicant would provide for fish passage for roads crossing fish bearing streams. Lifeform habitat monitoring would evaluate the availability, growth, and suitability of habitat for all 16 Lifeforms (see HCP Section 5.1.7). Modification of the HCP as a result of new information, research, or monitoring results is discussed in HCP Section 5.3.2 (Extraordinary Circumstances) and Section 5.3.5 (Amendments and Flexibility). Species' responses to forest practices may be studied indirectly by evaluation of the effectiveness of RHA prescriptions on amphibian populations and small mammal densities in managed old-growth and dispersal forest stages. Details regarding response variables, biologically important differences, levels of significance, estimated variances, tests, and power calculations would be developed by the individual researchers at the time the studies are designed and implemented. The Services would conduct compliance monitoring and reports would be made available to the public (see Response to Compliance Monitoring).

G. Reporting

Comment Summary:

The WDFW recommended that the reporting schedule include the results of owl monitoring. The Sierra Club stated that there was not enough monitoring and reporting and recommended the Services include additional requirements. They wondered whether the public would have access to monitoring reports. One local organization recommended that the monitoring and reporting intensity should not decline.

Services' Response:

The Services designed the reporting schedule to be consistent with biological concerns and the goals and objectives of the various monitoring efforts. Rather than have an equal distribution of reporting for owl monitoring, the Services believe it is important to have additional monitoring and reporting during the earlier years of the Plan. If, during the first 20 years of the Permit period, the owl population is responding to the removal of habitat to a larger degree than anticipated, the Services desire to have the ability to detect and respond to that change. This dictated that the Services have frequent reporting at certain times. For instance, reports on the verification of the owl model would occur four times by year 20. In comparison, little such change in owl habitat is expected between years 40 and 50. The Services note the concern about the total amount of reporting effort, but believes HCP monitoring and reporting should be commensurate with risk. Given the attention to the species of primary concern and the habitat-based approach used for this HCP, the Services believe the level of reporting is appropriate. The Services further elaborate on this topic in response to comments on Monitoring and Compliance Monitoring. The periodic reports would be available to the public upon receipt by the Services. The reporting schedule is presented in Table 31 in HCP Section 5.1.

H. Compliance Monitoring

Comment Summary:

The Puyallup Tribe of Indians, Defenders of Wildlife, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, Washington Environmental Council, and six individuals (one comment on a preprinted card) commented on compliance monitoring. Commentors either suggested or questioned whether the agencies would be reviewing activities conducted under the HCP. The Northwest Ecosystem Alliance, the Sierra Club, and one individual suggested suspending the Permit if the agencies

did not have the ability to monitor the actions conducted under the Permit. The Puyallup Tribe of Indians requested annual reports and one individual questioned if there would be auditing. One individual remarked that Applicant conducted monitoring is like putting the "fox in charge of the chicken coop". One of the individuals requested that the steps be explained.

Services' Response:
Applicant monitoring was described in HCP Section 5.1. The Services believe that the proper conduct of monitoring is important. Monitoring is also expensive. The Services expect the Applicant to conduct monitoring as a part of the mitigation package. The Services believe it is the duty of the Applicant to monitor the HCP as directed by regulations implementing the ESA. The level of monitoring should be commensurate with the levels of uncertainty surrounding the various aspect of the project.

The Services would receive periodic reports from the Applicant containing results of monitoring and other pertinent information. For instance, sampling to demonstrate that the HCP is being properly implemented (Implementation Monitoring) would be conducted. This would include conducting post-harvest cruises on a portion of the harvest units and reporting of habitat levels as projected. Results Monitoring would also be conducted to demonstrate that certain treatments had the desired result. Effects Monitoring, such as the owl monitoring outlined in FEIS, Appendix 4, Section 5.1.2 would be conducted. Additional monitoring associated with watershed analysis would also be conducted by the Applicant. The periodic reports would be available to the public upon receipt by the Services, although no announcements are likely to be distributed. The reporting schedule is presented in FEIS, Appendix 4, Section 5.1, Table 31.

In addition, the Services would conduct Compliance Monitoring. The Services reserve the right to perform on-site inspections. The Services also would rely on the reports to guide where Compliance Monitoring may be most effective. The Services are exploring mechanisms on a programmatic basis to make use of technological advancements and efficiencies available to effectively conduct Compliance Monitoring. The intent of the Services is to conduct this compliance monitoring program for forest-based HCPs in a cost efficient, yet effective, manner. The Services agree with the commentors that multiple sampling and monitoring programs are necessary to evaluate conditions in the Planning Area.

I. Mitigation

Comment Summary:
The Puyallup Tribe of Indians suggested that a mitigation fund should be mandatory in the HCP. The Sierra Club-Cacades Chapter commented that Plum Creek's mitigation plan was inadequate for the Permit period. The Washington Environmental Council stated that the Council members are more interested in conservation than restoration. One individual wondered if there had been any mention of Plum Creek donating critical lands to the Nature Conservancy.

Services' Response:
The Services believe the monitoring plan is adequate to determine if the objectives of the HCP are being met. Commercial forest management practices recognize the dynamics of the forest while the Applicant's Environmental Principles recognize the need to conserve environmental values. Many components of the mitigation program are integral components of the HCP itself, such as the retention of current amounts of old-growth and protection afforded riparian buffers. These components of the

mitigation program are discussed in the HCP (Section 3.6). The Services believe that the mitigation included in the HCP fully compensates for the levels of take expected in the Planning Area. The nature of the Applicant's business precludes preservation as a management option. Section 3.7 of the HCP analyzes the Issuance Criteria for the Permit which addresses the Applicant's ability to fund the HCP. Applicant donations of land were not addressed in the HCP.

J. Assumptions

Comment Summary:
The Forest Service requested an analysis of the indirect effects of the Proposed Action on the goals of the Northwest Forest Plan (NWFP) using assumptions consistent with the assumptions used in development of the NWFP. They further state that many of the habitat associations and definitions of suitable habitat are different from those used in developing the NWFP. These assumptions may lead to different conclusions. The WDFW does not believe owls should be assumed to persist in the NWFP Matrix areas and questioned the assumptions made regarding the SPAMA. The National Audubon Society referred to the assumptions in the HCP as speculative, and 11 individuals requested that the assumptions be modified to include a margin of safety or to be more conservative. The Sierra Club-Cascade Checkerboard Project believed there was no basis to assume that all species in Lifeforms would utilize the secondary habitats to a significant degree. The WDFW suggested no owls would remain in Matrix areas.

Services' Response:
The Services believe that the habitat definitions and habitat associations are based on information and results gathered in the Planning Area and are appropriate for the species involved. Definitions of habitat used to make projections into the future cannot always utilize the same parameters (e.g., downed logs or trees with defects) as available for assessment of current habitats. The Services believe the appropriate adjustments have been made in this regard. Regarding secondary habitats, the Services agree with the commentor. It cannot be assumed that secondary habitats would fulfill all the needs for each species in a given Lifeform. It is for that very reason that the Services decided to display the primary habitats and not just total amounts of suitable habitat in each of these cases. This allows the reader to understand the levels of habitat that would be available to a species not able to utilize secondary habitats. In addition, where little primary habitat was expected, the Services conducted a species-by-species assessment. This approach is further described in response to comments under Multi-Species Approach.

The most fundamental operational assumptions involved adjacent and intermingled ownerships. The assumptions used regarding future management actions were based on ownership and management designations. Private and State lands were modeled aggressively. Federal lands were modeled according to the NWFP. A primary set of assumptions were used in the modeling efforts regarding the SPAMA, Matrix, and LSR lands. Based on early feedback from Forest Service personnel, a second set of assumptions were developed for comparison to the primary set of assumptions. The Forest Service provided "worst-case" estimates of initiations of treatments, completion of treatments, volumes of harvest, size classes of trees to be harvested, and general location limitations to harvest. The Services and the Applicant compared the results of these treatments, in terms of stand-structure classes, to the primary set of assumptions and determined that the primary set of assumptions were at least as aggressive across the landscape and differed very little from the results expected under the secondary set.

K. Multi-owner Coordination

Comment summary:
The Wilderness Society, Sierra Club, and five individuals commented that either the analyses didn't consider adjacent lands or questioned whether it considered adjacent lands. The intent of these commentors was to indicate the importance of coordination. The Muckleshoot Indian Tribe corrected the Services and indicated that the referenced study related to the Howard Hanson Dam, a Corps of Engineer's project. The Northwest Indian Fisheries Commission and one individual indicated that the Plan should match the prescriptions developed by SPAMA.

Services' Response:
Private landowners are not expected to match the actions carried out on Federal lands. This is particularly true where Federal land-management activities are still subject to the planning process and public comment. Private landowners are expected to comply with the ESA and its implementing regulations. The Services must comply with the ESA and NEPA, among other guiding laws, regulations, and tenets. In the spirit of these guidelines, which include directions to consider cumulative effects, and driven by the checkerboard pattern of ownership within and around the Planning Area, coordination with other land managers became a critical portion of the HCP. Data was gathered across all ownerships within the Planning Area and surrounding areas as well. These efforts are described in HCP Section 2.6. Assumptions were made by the Applicant on a worst-case scenario, in consultation with the Services and the Forest Service. Together, these actions allowed the estimation of current conditions as well as the projection of future actions in a reasonably accurate fashion. The Services believe the level of coordination that has been achieved could serve as a model for other similar efforts.

L. Relationship to Management on Federal Lands

Comment Summary:
The WDFW questioned the assumptions made regarding the SPAMA. The Northwest Ecosystem Alliance suggested that the Applicant should be required to adopt the NWFP ROD. The Sierra Club-Cascade Checkerboard Project and the Wilderness Society questioned the relationship of the Plan to the SPAMA Plan, whether it was consistent with that Proposed Plan, and the relationship to other aspects of the NWFP. One local organization noted that the SPAMA planning is in process and another local group commented on the need for consistency in assumptions. Another local organization indicated the HCP and NWFP should be consistent. The Northwest Indian Fisheries Commission and the Puyallup Tribe of Indians indicated that the Plan should be consistent with the NWFP and the same as SPAMA. Eight individuals remarked on the relationship to the Federal lands. Their remarks were similar and included that the Plan relies too heavily on the NWFP and SPAMA, the impacts of the HCP to the Federal lands should be considered, management on private lands should match Federal lands, and that the plans were not integrated. A petition received from a local organization noted the checkerboard ownership pattern. The Northwest Forestry Association indicated the checkerboard pattern is an operational and analytical nightmare. A member of the Washington House of Representatives indicated support for the Plan and that the need to consider the relationship to Federal lands presented an additional challenge. A professor in the College of Forest Resources at the University of Washington stated that the Proposed HCP supplements the SPAMA. The Washington Forest Protection Association stated that the HCP augments the NWFP. An individual supported the Plan indicating that it is appropriate when implemented in concert with the NWFP.

Services' Response:
The Services believe that it was necessary to understand the likely management scenarios on adjacent lands to adequately plan for this landscape. The existence of the NWFP and its stated goals, objectives, and emphasis statements allowed for an adequate assessment of reasonably foreseeable events. Under this Plan, the private lands make a contribution which would supplement and not detract from the management on Federal lands, while allowing the flexibility of different standards and guidelines. The Plan relates well to the NWFP and does not preclude a number of possible actions including land exchanges.

M. Federal Lands Take Burden

Comment Summary:
The National Audubon Society, Northwest Ecosystem Alliance, Sierra Club-Cascade Checkerboard Project, four local organizations, and seven individuals believed that the public and Federal lands were bearing too much of the conservation burden. They believed that the Federal lands should not bear all the burden of conservation while private lands are exempted. The Sierra Club-Cascade Checkerboard Project also commented that the Applicant is externalizing costs. An individual commented on the importance of instream flow monitoring and reporting, but indicated that the Services and not the Applicant should bear the cost. A professor in the College of Forest Resources at the University of Washington, supported the HCP and indicated that it is making the appropriate level of contribution expected of private landowners.

Services' Response:
The Services believe that Federal lands must bear the primary responsibility for the conservation of species and ecosystems. However, these goals are often not possible on Federal lands alone. Contributions from private lands are often needed as well. This is especially true on a checkerboard ownership pattern such as exists within the Planning Area. The Services believe that the commitments made in the HCP are substantial and exceed the ordinary expectations for contributions by private landowners. In addition, should new information become available, the HCP provides for adjustments which might increase the level of commitment made by the Applicant.

N. Federal Deviations from Management Plans on Federal Lands

Comment summary:
The Yakama Indian Nation questioned why the Applicant would not be required to provide additional mitigation should a change in the NWFP occur. The Northwest Indian Fisheries Commission asked what would be required should the NWFP be weakened. The Defenders of Wildlife also remarked regarding the "lawless logging rider". The National Audubon Society, the Sierra Club, and the Washington Environmental Council expressed concern regarding the dependance on the NWFP in spite of the efforts by Congress in the Rescission Act. The Wilderness Society suggested that the HCP should be suspended should the NWFP be weakened. Three local organizations commented on the "logging without law" rider and one of these explicitly suggested the Applicant should be required to compensate for such deviations from the NWFP. Eleven individuals (two comments on preprinted cards) indicated that deviations are possible, Congress is intent upon weakening the NWFP, or stated that owl nests have already been logged as a result. Some of these suggested that the Applicant be expected to compensate. A professor in the College of Forest Resources at the University of Washington commented on the long-

term stability of the NWFP.

Services' Response:
The Services are extremely concerned about the effects of deviations from the NWFP. The NWFP was based on science, and deviations from it may seriously affect the viability of many species. The Services hope that these short-term deviations would be minimized or would be compensated by other adjustments to management on Federal lands. Moreover, any material change to the NWFP could cause the reinitiation of consultation under section 7 of the ESA and incidental take would not be permitted if such a change would cause jeopardy to a species. In spite of these potential deviations, the Services believe the analyses presented in the DEIS remain accurate at the present time for the following reasons: (1) the Services are not aware of any sales authorized by the Rescission Salvage Logging Rider to the Rescissions Act and subsequent litigation within the Planning Area; (2) deviations are expected to be short-term and the Permit period extends to 100 years; and (3) the Services would further explore the changes to the baseline as result of NWFP deviations and recent harvests as it completes its section 7 analysis at which time more information may be available. In spite of the potential for deviations now and in the future, the implementation of the NWFP is the most likely and only reasonably foreseeable scenario when analyzing management possibilities for the next 100 years. The Services believe consideration of the cumulative effects based on the NWFP are sufficient to meet and exceed the requirements of NEPA.

O. Roadless/Wilderness Areas

Comment Summary:
The Northwest Indian Fisheries Commission, Defenders of Wildlife, The Wilderness Society, Sierra Club-Cascade Checkerboard Project, Northwest Ecosystem Alliance, Rivers Council of Washington, Washington Environmental Council, Washington Native Plant Society, 8 local organizations, 95 individual letters, and 424 preprinted cards (477 signatures) commented that Plum Creek should prohibit roads and clearcutting in roadless areas and defer all logging until a land exchange with the Forest Service can protect habitats in these areas. The Sierra Club-Cascade Checkerboard Project also pointed out that they thought that the map in the DEIS showing roadless areas was incorrect and stated that protection of roadless areas is critical to the success of the Northwest Forest Plan and HCP. The Washington Native Plant Society commented that planned logging in roadless areas would reduce the effective patch size of interior old-growth ecosystems, endangering special environmental conditions. One individual in the College of Forest Resources at the University of Washington commented that he hopes the roadless issue raised by some environmentalists does not inappropriately cloud an evaluation of Plum Creek's HCP which is appropriately focused upon stewardship of wildlife and fish resources. One individual, on a preprinted card, suggested the Plan should enforce exclusion of motorized vehicles from wilderness and another, the need for more wilderness in general.

Services' Response:
The Services recognize the wildlife values contained in the subject roadless areas. Due to the uncertainty of the size and timing of exchanges with the Forest Service, the Applicant has not included exchanges and deferrals as a mandatory component of the HCP. This same uncertainty, together with current regulatory constraints on forest management activities, precludes the Applicant from deferring harvest activities in all roadless areas. The Applicant has indicated a willingness to consider deferring on-the-

ground activities in most of the unroaded areas provided the Applicant was assured regulatory flexibility, offered by the ITP, to harvest in other areas and if real progress is being made to consummate a land exchange within a 3-year period. Reduced harvesting in roadless areas (i.e., in biologically desirable areas) remains an option in all alternatives. Should exchanges become a reality, nothing in the HCP would preclude such an exchange provided the exchange was consistent with HCP goals and objectives. Figure 1 in the DEIS has been modified to more accurately reflect roadless conditions within and in proximity to the Planning Area. See also response to Federal Deviations from Management Plans on Federal Lands. Management or expansion of Wilderness Areas are beyond the scope of this project.

P. Land Exchanges

Comment Summary:

The Northwest Indian Fisheries Commision, Muckleshoot Indian Tribe, Puyallup Tribe of Indians, Sierra Club-Cascade Checkerboard Project, Wilderness Society, Washington Environmental Council, Washington Native Plant Society, one local conservation organizations, and 17 individuals (three comments on preprinted cards) commented on issues regarding land exchanges. Comments included that the DEIS does not indicate which lands in the I-90 corridor are being considered for exchange or what criteria are being used to identify exchange areas, land exchange should be a major goal of the HCP, land exchange is one mechanism that could allow Plum Creek to continue their harvest of forests without making ancient forests into glorified crops, the HCP does not adequately acknowledge and plan for land exchange as a way to minimize taking of endangered species, support for Plum Creek's receptiveness to land exchanges, recommendation that a good faith effort to pursue land exchanges, sales, and donations be a condition of the Permit, the Forest Service should purchase private checkerboard lands, and urged that the Plan include land exchanges or outline alternatives for exchange. Commentors suggested that harvest be deferred or NRF, FD, and riparian buffers maintained to federal standards in areas proposed for exchange. One commentor noted that without a land exchange, it would be impossible for the HCP goals (scientifically credible and comprehensive) to be met. One commentor suggested that the Forest Service acquire and consolidate a several mile wide corridor along the path of the Pacific Crest Trail. Changes to land ownership from future land exchanges should be considered in models used in environmental impact analyses.

Services' Response:

The Applicant addresses impacts of land exchange in Section 5.3.4 of the HCP. Land exchanges are a part of a continuing dialogue between the Applicant and the Forest Service. At this time both parties are analyzing a major land exchange in the Planning Area. However, the size and timing of exchanges could not be reasonably forecasted, therefore such exchanges are not included in the HCP. The HCP goals and objectives were designed to be achieved without benefit of a land exchange. See response to Roadless/Wilderness Areas.

X. PUBLIC INVOLVEMENT

Comment Summary:

Two members of the Washington House of Representatives supported the level of public comment and the extra efforts to invite public comment. One local group and a petition cited the unavailability of documents. The Muckleshoot Indian Tribe complained about the delays in receiving technical papers. Two individuals complained about delays in receiving documents. Several individuals also remarked that there was a lack of documents at the Central Washington University. The Sierra Club-Cascade Checkerboard Project also commented on the availability of documents. A local group indicated public

involvement would be absent in the future. The Washington Forest Protection Association believed the public involvement process was very open. One individual believed the public involvement was poor. The Northwest Indian Fisheries Commission questioned whether the annual reports would be available to the public. In general, many people believed the Government closures (commonly referred to as "furloughs"), contributed to delays in receiving documents and to the Services' ability to respond to the needs of the public.

Services' Response:

The HCP was announced in the Federal Register on November 17 and again on November 24 and was preceded by a news release with a resulting number of articles (e.g., front page of Tacoma News Tribune October 30, 1995). The Services exceeded all guidance on length of comment period, staffed the telephones with "critical" personnel during the furlough, and extended the comment period an additional two weeks.

The Services believe that providing a comment period which lasted from November 17 to January 22 was sufficient. NEPA requires a 45-day comment period and section 10 of the Endangered Species Act requires but 30-day comment periods. The Services believe that having provided more time than is required and more time than is customary for the Department of Interior regarding environmental impact statements, in conjunction with the aggressive outreach program, that the needs of the public to comment on this type of undertaking has been satisfied. The Services recognize the documents are large and the concepts are often complex. Therefore, key components of the documents were constructed to provide the reader with a ready source of information. For example, HCP Section 3.6 covers mitigation measures and measurable criteria in a succinct and direct format, HCP Table 30 displays the stand structures for each decade on the Applicant's lands as well as all ownerships within the Planning Area, and, lastly, the Executive Summary of the draft EIS provides a series of tables displaying components of alternatives and their anticipated impacts.

The Services regret any delays in distribution. Those persons on the distribution list should have received their copies prior to November 10. Other persons usually received copies of documents with a few days of requests. The exceptions are duly noted. Delays and unavailability of Technical Reports is a moot issue. These were not part of the application package or the NEPA document. The Applicant did choose to enhance the publics' ability to learn more about many of the issues by making these products available at no cost. In addition, as noted in the November 17 Federal Register, these Technical Reports were made available at a number of local and regional libraries. The Central Washington University Library has written a letter which clarifies the confusion on their part in properly processing these documents and apologized that the documents were largely unavailable until late in the comment period. Individual Technical Reports were also distributed by the Applicant to interested parties requesting them. An average of 15-20 copies of each Technical Report were distributed through the mail as a result of these requests.

Future public involvement may occur in several ways. Any major amendment to the Plan (an amendment which would increase the level of take or significantly alter the level of impacts) would be subject to additional NEPA review. In addition, periodic reports would be submitted to the Services and these would be available to the public upon request.

A. Peer Review

Comment Summary:

The WDFW disagrees that peer review should be required in the event of Extraordinary Circumstances and they believe it may cause unnecessary delays in action. The Yakama Indian Nation requested peer

review for the research behind the Plan. The Defenders of Wildlife requested independent scientific review. National Audubon Society requested review of models and assumptions. The Northwest Ecosystem Alliance, the Sierra Club-Cascade Checkerboard Project, and one local organization requested that the HCP or the next version of the HCP receive peer review. The Sierra Club and one local organization, with attached petition, requested the names and/or comments of the peer reviewers. One local organization requested ongoing peer review of the HCP. Furthermore, they strongly insisted upon "blind peer review". It is ironic that the persons most supportive of blind peer review were also the most insistent regarding obtaining the names and phone numbers of peer reviewers. Ten individuals requested more rigorous peer review or questioned the level of peer review. One individual suggested peer review for monitoring efforts and wondered who would be involved. A member of the Washington House of Representatives supported the use of scientifically credible peer review in this process.

Services' Response:
The Applicant initiated peer review of a number of Technical Reports describing its attempts at data accumulation, surveys, research, and assessments of situations such as limiting factors. Peer review comments were solicited from over 50 scientists. Services personnel reviewed and approved the list of peer reviewers. It was determined that each Technical Reports had a balanced set of scientists with expertise in that particular subject area. Services' personnel also reviewed each of these Technical Reports. The HCP and DEIS were reviewed by a number of Federal and State agency personnel on several occasions before being released to the public. These reviews included staff with expertise in the fields of wildlife, fisheries, and forestry, with special emphasis on endangered species such as spotted owls. The Services support the use of peer review. However, it must be noted that this process involves the often voluntary actions of a number of scientists with ongoing responsibilities in their current jobs. Peer review under normal situations places a tremendous burden on their personal or job-related workloads. Because of this, and Privacy Act requirements, the Services would not release the names, addresses, or phone numbers of peer reviewers without their permission. The Services believe release of these names would compromise the cooperative nature of peer review by placing additional burdens on those people. The Services are disappointed that the Applicant was persuaded by a local organization to release the names of the reviewers. In regard to the comments made by the WDFW, the Services note that, in the event of Extraordinary Circumstances, the necessary actions would be taken without delay and this would be followed by peer review as discussed in the Implementation Agreement (Appendix 10 in the HCP).

B. Public Input

Comment Summary:
Two members of the Washington House of Representatives believed the level of communication was very good. The Washington Forest Protection Association believed the effort reached out to a diverse group. The Northwest Ecosystem Alliance suggested that the public have input regarding future reports and amendments. The Sierra Club suggested the use of public input regarding peer review, monitoring, and amendments. The Washington Environmental Council requested additional details regarding the models to be made available for public comment. One individual requested greater public input into the monitoring program. Another individual remarked that the level of public input was poor.

Services' Response:
The Services would seek additional input as required by law and where major changes occur in the Plan or implementing procedures where it is either in the best interest of the public or where the Services can

benefit from the receipt of additional comment. Monitoring results and annual reports would be available for public inspection. The Services note that the subject documents have and are undergoing public review and that the scientific underpinnings in the form of the Technical Reports have been subject to peer review. The Services believe these are adequate and appropriate.

C. Release of Information

Comment Summary:

The Wenatchee National Forest requested additional information on sightings and occupied habitat of sensitive species. The Sierra Club-Cacades Chapter requested better access to data and stated that feasibility data should be released to demonstrate the range of alternatives. The Sierra Club also suggested that the scale of maps should be larger and include species habitats and range maps. One local organization requested that they be given the ability to review the comments. Another local organization and attached petition requested better maps be provided to the public. An individual asked whether they would be given results of monitoring so that the public could audit those results. Another individual requested the scientific literature upon which the Plan is based. The Washington Forest Protection Association stated that the Applicant has made available its scientific findings for use in the development of alternative rule-makings at the State level with regard to spotted owls. A number of commentors included a desire to have locations of threatened and endangered species made available to the public. One individual remarked that the documents included excellent maps.

Services' Response:

The Services have included summaries of the comments herein. Actual comments are available upon request. All of the data used by the Services are available upon request, but the vast majority of such information is already embodied in the HCP, DEIS, or the Technical Reports already distributed to the public. The Services agree that the maps provided by the Applicant in the documents, particularly the HCP and the Technical Reports, have made the Plan and the underlying principles easier to understand. The Services note that threatened and endangered species locations are closely guarded by the Services and the WDFW. Strict protocols are in effect to limit the distribution and potential abuse of such information. See the Response to Guilding and Predictions/Models/Sensitivity Analysis for why species habitats and range maps are not included in the HCP. In regard to the release of feasibility data for analysis of alternatives, see the Response to Range of Alternatives.

XI. SECTION 7 CONSULTATION ISSUES

Comment Summary:

An individual remarked that the baseline is unknown and that the jeopardy level should be better defined. He remarks that research done by the Applicant does not indicate whether the population of northern spotted owls in the Planning Area is increasing or decreasing or whether it is approaching a threshold from which it might not be able to recover. The WDFW and an individual believe the assessment of take for owls presented in the HCP and the DEIS is inaccurate. The Yakama Indian Nation believes that greater than 50 owl sites will be taken during the course of the Permit period. The Sierra Club-Cascade Checkerboard Project, one local organization, and an individual indicated they had concern that the HCP may cause jeopardy for the owl. The Sierra Club-Cascade Checkerboard Project and one individual believe the Plan may cause jeopardy for other species as well. The Sierra Club-Cascade Checkerboard Project and one local organization remarked that take was not estimated for species other than spotted owls. The Defenders of Wildlife questioned why the Federal government is allowing changes to the section 7 consultation process and in particular why the "no jeopardy" standard changed per the

Implementation Agreement.

Services' Response:
The Services believe that sufficient baseline information was provided in the DEIS to satisfy the requirements of NEPA, see Chapter 3.0 of the DEIS. The Services' Biological Opinion would contain additional information regarding the baseline for the covered species. Jeopardy is defined in 50 CFR 402.02. That definition reads as follows: "*Jeopardize the continued existence of*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, number, or distribution of that species. The Services would continue to adhere to that definition. The referenced portion of the IA, Section 9 (entitled *Findings),* is preceded with the following statement in the draft IA: "*The following findings would not become final until after the opportunity for public comment on the HCP and related documents. They are included here for illustration only during the comment period*". The Services believe the reader did not understand that this was a preliminary example of the text of a finding rather than a definition. As stated above, the Services do not intend to change the definition of jeopardy or the "no jeopardy" standard. In response to comments, a revised estimate for take of northern spotted owls has been incorporated into this document based on a further analysis. Those estimates and discussions regarding the attendant impacts can be found in Section 4.8.1.1. Whether or not jeopardy is likely would be addressed in the Services' consultation/conferencing documents under section 7 of the ESA. This determination would be made before any Permit is issued. The Services have not determined at this point that the HCP would avoid jeopardy for all species. However, the Services should point out that the HCP was designed to avoid jeopardy of all species and was designed with particular emphasis on owls. Revised take estimates based on further analysis by the Services may be forthcoming at the time the section 7 consultation is completed.

XII. ESA SECTION 10 PERMIT ISSUANCE CRITERIA

Comment Summary:
The Northwest Indian Fisheries Commission, the Defenders of Wildlife, National Audubon Society and a local chapter, Northwest Ecosystem Alliance, Wilderness Society, Washington Native Plant Society, the Sierra Club-Cascade Checkerboard Project, three local organizations, and five individual signers to four sets of comments, raised various issues regarding the section 10 issuance criteria. Comments most frequently expressed the opinion that one or more of the criteria were not fulfilled by the proposed application, and that a Permit should not be issued. The Defenders of Wildlife believe HCPs should advance species recovery. Although the three most singled-out criteria were the Jeopardy Standard, the Minimization and Mitigation Duty of the Applicant, and Incidental Take definition, all requirements for Permit issuance are dealt with below.

Services' Response:
The Incidental Take Permit issuance criteria are stated in section 10(a)(2)(B) of the ESA and at 50 CFR 17.22(b)(2), and 50 CFR 17.32(b)(2) and are incorporated here by reference. In some of the letters received, these criteria were restated incorrectly, or applied out of context, accounting for a substantial amount of the controversy as to whether a permit might be issued on this draft application. A decision has not been made yet in this regard, but, the decision to issue a permit would depend inextricably on the permit applicant meeting the criteria stated in the sections cited above. This means that to issue the Permit, the decision-maker would have to find the following:

A. Incidental Take

The taking would be incidental, (to and not the purpose of, the carrying out of an otherwise lawful activity). Many commentors asserting this criterion could not be found, miscast the word "incidental" as meaning "occasional" or "in small part." However, when taken with the statement included above from section 10(a)(1)(B), "incidental" means "occurring during the course of, but not as the purpose of carrying out another legal activity." In the case of the present Proposed Action, the "otherwise legal activity" is the management of the subject Planning Area for commercial timber production. Thus "incidental take" does not necessarily imply a quantitative determination of take. Nor does a certain level of take short of the Jeopardy standard (stated below) necessarily preclude permit issuance.

B. Applicant's Duty to Mitigate

The Applicant would, to the maximum extent practicable, minimize and mitigate the impacts of such taking. Again, from the language contained in public comments, it appears reviewers have misunderstood the application of this criterion in reviewing an application for an Incidental Take Permit. The most common misconceptions revealed in public comments regarding this criterion involved: (a) the linkage between the Applicant and the "maximum extent practicable" standard; and (b) exactly what gets "minimized and mitigated." Some commentors misstated the criteria as maximum extent "possible," which is clearly incorrect and entirely changes the sense of what is required of the Applicant. "Practicability" refers to economic and operational feasibility for the Applicant in the context of the activities it proposes under the requested Permit. Since the Applicant is proposing to do the minimizing and mitigating, practicability is not an objective parameter. Many commentors also stated that the HCP must minimize and mitigate the take or the effects to the species, rather than *the impacts of the take*. Again, these mistaken restatements of what is required of an ITP Applicant can completely undermine a reviewer's understanding of what comprises an adequate application package.

C. Adequate Funding Assured

The Applicant would ensure that adequate funding for the HCP would be provided. The implementing regulations add the following: "*and procedures to deal with unforseen circumstances would be provided*." At first blush, the adequate funding provision appeared relatively uncontroversial among reviewers. Some writers suggested the Applicant should be required to make a stronger showing of commitment to funding the HCP. Some even suggested the Applicant be required to post a bond to ensure its commitment as has been done in other regions of the country in other planning processes.

The Services respond that posting a bond or establishing mitigation trust funds has most frequently been used in HCP projects where the underlying proposal involved permanently converting habitat to a nonhabitat condition. That situation is inapposite here, where although habitat may be modified, the proposal does not envision permanent conversion. As a result, the Services are confident in the agreements they negotiated with this Applicant as they are captured in the Implementation Agreement. That agreement includes the Applicant's assurance that the HCP would be adequately funded throughout its duration. In this regard, the Services have requested and the Applicant has agreed to periodically report its financial condition to assure the Services of its continuing ability to meet its HCP commitments. The IA has been modified accordingly to include periodic financial reports. See also responses to *Funding.*

The handling of Unforeseen Circumstances in the proposal is founded on written Departments of Interior and Commerce policy interpreting the ESA, and is handled as a separate topic in this appendix.

D. No Jeopardy

The taking would not appreciably reduce the likelihood of the survival and recovery of the species in the wild. This is a restatement of the Jeopardy standard. Not only must this finding be made under section 10 of the ESA, but the Services would be required to undergo a similarly rigorous analysis under section 7, during intra-Service consultation on the Proposed Action of issuing the requested Permit. See response to *section 7 consultation issues.* Finally, the Jeopardy issue is important also because of its linkage to the Extraordinary Circumstances provisions. That topic is covered under HCP Implementation topics in this appendix.

E. Other Measures

Comment Summary:

Under the catch-all topic of "Further Measure," the Services received a variety of comments from the Defenders of Wildlife, the Checkerboard Project, and others. Included were comments that the Services should have asked for "further measures."

Services' Response:

The measures, if any, required under subparagraph (A)(iv) would be met; and (the Secretary) has received such other assurances as he may require that the HCP be implemented. The HCP incorporates additional species-specific monitoring to ensure jeopardy is avoided and the Services require the Applicant to sign the Implementation Agreement (IA) to ensure implementation of the HCP. The Services do not believe that any further measures are needed per section 10(a)(2)(B)(5).

XIII. MISCELLANEOUS

A. Permit and Issuance Process

Comment Summary:

One individual stated that the Services should have provided a more explicit description of the section 10 Permit process and another stated the Services should have included a copy of the Permit in the package that was provided for review.

Services' Response:

The actual Permit is not prepared until well after the public process is completed. The Permit itself is far less informative than the components to the application that are provided for public review. Finally, in the context of this project, the Services do not believe there is a need to explain the context of ITP issuance in a different manner than appeared in Section 1.0 of the DEIS. Should the public desire additional information on this subject they should contact the Services.

B. Technical Reports Associated with the HCP

Comment Summary:

The Services received a number of comments pertaining to the Applicant's Technical Reports associated with the HCP.

Services' Response:

Comments regarding Technical Reports have been forwarded to the Applicant. Reviewers are reminded that Technical Reports are not a component of the NEPA or HCP documents; however, the subject of many of those comments were addressed under the appropriate topic.

C. Typographical Errors and Ambiguity

Comment Summary:
One individual remarked that typos and ambiguity can have big meaning.

Services' Response:
The Services agree and have made an effort to correct errors and eliminate ambiguity to the maximum extent possible.

D. Incorporation by Reference

Comment Summary:
The Puyallup Tribe of Indians endorsed some of the comments made by the Northwest Indian Fisheries Commission. The Wilderness Society incorporated the comments of the Checkerboard Project. The Washington Environmental Council concurs with the Audubon Society and the Wilderness Society. The Northwest Ecosystem Alliance supported the comments made by the Cascade Checkerboard Project and the Audubon Society. The Mountaineers referenced portions of comments made by the Wilderness Society, The Checkerboard Project, and the National Audubon Society. Ridge supported the comments of Mr. Johnson, Mr. Fraser, Ms. Tanke, the Sierra Club-Cascade Checkerboard Project, and the Yakama Indian Nation. Ms. Tanke supported the comments make by the Sierra Club-Cascade Checkerboard Project.

Services' Response: The Services recognize the concurrence with other comments. Comment summaries contained herein by topic only reflect those comments submitted by the original commentor.

E. Specific Areas

Comment Summary:
A number of commentors, in letters or on cards, addressed specific locations, inside and outside the Planning Area and some locations unknown to the Services and the Applicant. These remarks included "protect areas along Carbon River, South of Sumner", "Please save Scatter Creek Trails", "French Cabin Creek has had past logging near Stream". One individual commented that “Plum Creek drainage” deserves careful protection.

Services' Response:
The Services recognize the publics concern for particular sites, especially those sites with which they are familiar. The Services note that this is not a site-specific management plan, but encompasses 170,000 acres of the Applicant’s land. All areas within the Planning Area are addressed by this Proposed Action. The Services further note that riparian areas will be addressed as described earlier in this document. The Services believe the latter commentor has misinterpreted the term “Plum Creek” to be a physical feature in the Planning Area. Instead, this term is a part of the Applicant’s Company name (i.e., Plum Creek Timber Company, L.P.).

F. Remarks Regarding Destruction

Comment Summary:
A number of commentors remarked on this topic using the pre-printed cards to make statements such as "stop wrecking everything".

Services' Response:
These comments were too general and beyond the scope of NEPA to warrant response.

G. Revestment, History of Plum Creek Timber Company and Railroads, Tax Status, and Violations

Comment Summary:
A number of commentors remarked on these topics. One individual remarked that these topics were better left for another arena.

Services' Response:
The Services agree with the latter comment. Regarding violations, the Services note that violations, should they occur, will be dealt with according to the governing laws and regulations.

H. Past Practices

Comment Summary:
One individual commented that no one is exempt from worrying about old-growth because of the irresponsible practices of the past.

Services' Response:
The HCP recognizes the contribution of old-growth stands in meeting the habitat needs of late successional dependent species. See above responses to Amount of Harvest, Rotation Age, and Harvest Schedule.

I. Obligation to Future Generations and Expense to Business

Comment Summary:
The Services received a number of statements that pertained to this topic. Generally, these comments encouraged consideration of long-term ecological and economic viability and the conservation of resources for future generations. A portion of these went further to suggest that these actions were necessary in spite of the expense or impacts upon the Applicant.

Services' Response:
While the Services agree with maintaining long-term ecological and economic viability and the management of resources for all peoples and future generations, most of these comments were beyond the scope of NEPA.

J. Preserve Gene Pool of Plants and Animals

Comment Summary:
An individual made the suggestion summarized in the title of this topic.

Services' Response:
The Services concur with that statement as a goal, and have incorporated that philosophy throughout their actions.

K. Suggestions Regarding Federal Lands

Comment Summary:
A comment was received regarding the SPAMA plan. One pre-printed card indicated that "it's time for logging to start supporting itself and quit running over public lands" and another that "the Government should increase the costs charged to timber companies for cutting of any and all timber on forest lands to equal or exceed the prices paid to private parties for cutting their trees". Several comments were received regarding management of Wilderness Areas.

Services' Response:
The Services forwarded the SPAMA comments to the Forest Service. The remaining comments were beyond the scope of this NEPA effort because they deal with management of Federal lands and Federal timber. This Plan only addresses management occurring on private lands owned by the Applicant. See also Roadless/Wilderness response.

L. State Regulations

Comment Summary:
A chapter of the Audubon Society commented that the Proposed Plan is "little more than" State regulations, and the Washington Environmental Council commented similarly saying the HCP and DEIS fail to acknowledge that State regulations would not be effective for wildlife protection.

Services' Response:
The Services note that many components of the Proposed Plan exceed State regulations specifically for the protection of wildlife.

M. Pack Forest Accord

Comment Summary:
A professor at the University of Washington, College of Forest Resources, commented that Plum Creek has followed the basic principles laid out in the Pack Forest accords. He further states that there is a major emphasis in the HCP on the protection and enhancement of riparian zones which is where many believe private landowners should be focusing their stewardship.

Services' Response:
The Services were not a party to the above mentioned workshop and discussion paper. However, the Services are supportive of efforts by the timber industry to work cooperatively toward wildlife conservation.

N. Applicant's "Environmental Principles"

Comment Summary:
One individual encouraged the Applicant to continue to follow these principles while another remarked that their efforts in “New Forestry” and stewardship were effective and should continue.

Services' Response:

The Services recognize those comments.

O. Grow Hemp

Comment Summary:
One individual suggested on a pre-printed card that the Applicant consider hemp production, instead of tree production.

Services' Response:
Because the Services' and Applicant's policies preclude actions which violate laws and regulations, the Services assume that the commentor is referring to recent efforts at developing nonnarcotic hemp. In addition, hemp is shade-intolerant. The Services believe growing hemp would require significant overstory removal which would be detrimental to streams and other habitats. Native wildlife are adapted to forest environments and most species would not find usable habitat in such fields. The Services believe this comment was therefore beyond the scope of this project.

APPENDIX 3

Summary of Action Items in the Habitat Conservation Plan

CHANGES TO HCP IN RESPONSE TO PUBLIC COMMENT

WETLANDS

Section 3.4.1.1 Increased buffer size on nonforested wetlands and bogs greater than 5 acres to 100-foot minimum and 200-foot average which is significantly above State Regulations of a 25-foot minimum and 50-foot average.

Section 3.4.1.2 Increased restrictions to preclude more than one entry every 50 years, addressed protection for wetlands near streams, increased the size and amount of leave trees, and restricted use of ground-based equipment.

SPECIAL HABITATS

Section 3.4.3 Defined caves and increased the buffer around them from 25-feet to 100-feet. Also added that the 100-foot buffer would be managed to approximate FD habitat.

Section 3.4.5 Added Seeps and Mineral Springs. Described desired activities within 200 feet and the objectives of the resulting habitat.

Section 3.4.6 Added harvest method and desired condition of Ponderosa pine stands.

INTERIM AND MINIMUM GUIDELINES FOR RHAs

Section 3.3.3.1 For perennial, nonfish-bearing streams, the Plum Creek added a 30-foot zone near the stream where ground-based equipment is prohibited. The Plum Creek also added or extended the 100-foot buffer above 5,000 foot elevation on the east side of the Cascades for all 303(d) streams, and where bull trout or anadromous fish habitat is a concern.

NESTING PROTECTION

Multiple Sections For the spotted owl, marbled murrelet, and northern goshawk (Sections 3.2.1.1; 3.2.1.2; 3.5.2.4; 3.6.1; and 3.6.2), established a 0.25-mile radius circle around known nest sites from March 1 to August 31 to ensure no disturbance during the nesting season.

OWL MONITORING

Section 3.6.1 and 5.1.2 Modified the scope of owl monitoring from demographic surveys (Sections 3.6.1 and 5.1.2) at only deferral sites to RSPF model and deferral validation surveys distributed across the Planning Area. Owl monitoring will occur during 2-year periods culminating in reports in years 2, 10, 15, 20, and 40 for a total of 10 survey years. Sample areas will encompass about 10 to 15 percent of the Planning Area. The number of nest sites found will be compared to RSPF model projections and will be used to determine "trigger points" for actions under Adaptive Management.

STREAM TEMPERATURE MONITORING

Section 5.1.6 Increased stream temperature monitoring from two to five years.

ROAD MANAGEMENT

Section 3.2.1.3 Allowed some Phase II BMPs to be included in Phase I to better protect certain prime habitat types (e.g., wet meadows and avalanche chutes).

APPENDIX 4

Changes to Plum Creek's Draft Cascades Habitat Conservation Plan

Table of Contents:

Section 1.2.2.2 Major Subbasins:

Figure 3 changed to reflect correct western boundary of the HCP. See the end of Appendix 4 for revised Figure 3.

Section 1.5.1 The Northwest Forest Plan

pg. 64; Table 4 (DEIS Table 5) has been modified to more accurately reflect the acres by ownership in the Designated Areas and Matrix as outlined in the Northwest Forest Plan. See the end of FEIS Section 2.0 for a revised edition of this table.

Section 1.6 Consistency With Federal Programs:

pg. 72; second paragraph, last sentence:

For example, although the DCA management strategy outlined in the final draft Recovery Plan (Lujan et al. 1992b) has been superseded by the Northwest Forest Plan, the HCP would support opportunities for owls to disperse into and between the four DCAs in the Planning Area (i.e., WD-7, WD-8, WD-39, and WD-40), by providing adequate foraging and dispersal habitat in all riparian corridors in the Planning Area. The HCP would also provide NRF habitat to supplement owl sites on Federal lands.

Section 1.8 Land Access:

pg. 76; first sentence:

For the landscape and habitat analysis in the HCP, Plum Creek assumed that it had access to all Company lands and that timber on those lands was available for harvest. This includes access through harvest deferral areas to non-deferral stands.

Section 2.3 Stand Structure Classification System:

pg. 83; first paragraph, second sentence:

7) The age of these stands is less than 200 years and ~~they~~, although these stands can occur naturally as dense, large diameter trees, most of them have been selectively harvested.

Section 2.4 Spotted Owl Habitat Types:
pg. 84; third paragraph:
2) High quality Type C (marginal) habitat ~~can~~ may serve as NRF habitat in the eastern Cascades; whereas, mid-to low- quality Type C habitat generally provides at most, FD habitat at the stand level;

pg. 86; fifth paragraph:
3) Plum Creek would also, where practicable, set aside small (i.e., less than 5 acres) clumped, ~~forested~~ areas of older forest which would serve as "stepping stones within FD habitat" to enhance juvenile dispersal across the Planning Area.

pg. 87; ninth paragraph, first sentence:
Plum Creek developed a new definition of dispersal habitat for the east side of the Cascades (i.e., FMAZ 2 through 4) based on forest characteristics measured on more than ~~600~~ 944 plots taken at locations of radio-tagged breeding adult spotted owls (Hicks and Stabins 1995; Section 2.4).

Section 2.6.5.1 Primary Assumptions on Federal Lands:
pg. 95; third paragraph, under assumption 5:
o harvest activities will not alter ~~stand structure~~ forest class (Jensen 1995); and

Section 2.10.1.1 Literature Review:
pg. 103; first paragraph, fourth sentence:
The northern spotted owl is one of three subspecies of spotted owls recognized by the American Ornithologists Union (~~Johnsgard~~ AOU 1988).

Section 2.10.1.1 Age and Sex Characteristics:
pg. 103; The following change was made because the section does not discuss sex characteristics of spotted owls:
Age ~~and Sex~~ Characteristics

Section 2.10.1.1 Nesting and Breeding:
pg. 109; second paragraph, last sentence:
Finally, physical contact, as exemplified by mutual preening of feathers, also serves to strengthen pair bonds (Forsman and ~~Wright~~ Wight 1979).

pg. 109; third paragraph, fourth sentence. Clarification of citation use:
Rather than build their own nest, spotted owls often modify existing structures ~~(Buchanan 1991)~~. ~~Four~~ Five types of nest structures are used: broken tree-top cavities, lateral tree cavities, abandoned raptor stick nests, large horizontal branches, and debris platforms including mistletoe clumps.

Section 2.10.1.3 Factors Affecting Population Dynamics, Predation and Competition:
pg. 113; first paragraph, first sentence:
Key predators of spotted owls include the great horned owl ~~(*Bubo virginanus*)~~, northern goshawk, and red-tailed hawk (*Buteo jamaicensis*) (Lujan et al. 1992a).

pg. 114; fifth sentence:

In a study of ~~20 spotted owls and~~ infection levels by round worms, flat worms, and spiny-head worms in 20 spotted owls, Hoberg et al. (1989) found that more than 80 percent of the birds were infected with at least one worm species.

Section 2.10.1.4 Plum Creek's Spotted Owl Surveys, Spotted Owl Ecology in the Planning Area:
pg. 116; second paragraph, fourth sentence:
~~In fact, is near Humpback Creek west of the Cascade crest, and the second is near Easton Ridge, east of the spotted owl planning circles of 1.8-miles overlap in two areas that cross the I-90 corridor. The first Cascade crest.~~ In fact, spotted owl planning circles (i.e., 1.8-mile radius) overlap in two areas that cross the I-90 corridor. The first is near Humpback Creek, west of the Cascade crest, and the second is near Easton Ridge, east of the Cascade crest.

Section 2.10.1.4 Plum Creek's Spotted Owl Surveys:
pg. 119; third paragraph, third sentence:
Demographics
Owls on the east side of the crest...tend to have higher productivity levels (i.e., they often nest every year, have lower nest failure rates, and ~~often~~ may raise up to three young).

pg. 127; sixth paragraph, first sentence:
Home Range Analysis
Habitat selection in relation to availability within the home range of 15 individual spotted owls in the Planning Area was evaluated by Plum Creek (~~Herter and Hicks 1995~~ Hicks et al. 1995).

Section 2.10.2.1 Literature Review:
pg. 138; third paragraph, third sentence:
The population size of murrelets within the Plum Creek HCP boundary is unknown, but it is believed to be ~~insignificant~~ small.

Habitat characteristics
pg. 141; sixth paragraph:
The total predicted amount of suitable murrelet habitat (i.e., habitat located below the silver fir zone), based on 1988 satellite imagery, is approximately 718,000 acres State-wide. However, disconnected stands less than 15 acres are not shown on the 1988 data. Therefore, this is a slight underestimate of potential available habitat.

Nesting and Breeding
pg. 142; second paragraph, first sentence:
During the past 20-years, 61 nests have been located in North America; within the range of the listed population, ~~6~~ 8 have been found in Washington,...

Pg. 142; third paragraph, third sentence:
According to the ~~FWS~~ ROD requirements...

Section 2.10.3.4 Grizzly Bear Habitat Analysis in the Planning Area:
pg. 152; second paragraph, first sentence:
One of the objectives of the Grizzly Bear Recovery Plan (~~Almack et al~~. USFWS 1993, appended)...

Section 2.10.5.4 Mammals:
pg. 178; ninth paragraph, sixth sentence:
Myotis Bats
Thomas and West (1991) found no pregnant females in western Washington at study sites between 300 and 600 meters, whereas pregnant females were common on the east side of the Cascade range in Washington and in the Oregon Coast range (Christy and West 1993).

Section 2.10.6 Species of Concern:
pg. 192; Corrections to Table 15
Lifeform 14: Secondary: SI/SS/YF/PT
Lifeform 15: add beavers to Lifeform types

Section 2.12 Fish Resources in the Green River Subbasin:
pg. 206; fourth paragraph, sixth sentence:
The ~~Muckleshoot tribe~~ U.S. Army Corps of Engineers is currently conducting a feasibility study to redesign and reconstruct the...

Section 3.2 Multi-Species Approach:
pg. 229; second paragraph:
This HCP takes a multi-species, ecosystem approach to managing for all species found in the Planning Area. The biological needs of ~~named, unlisted species, and other yet unamed~~ vertebrate species (listed and unlisted, named and unnamed) are addressed by the HCP and are covered by the Implementation Agreement with the Services.

2) **Special Emphasis Species -** This group includes 21 species, all of which are Federal candidate species. These include species with the highest likelihood of becoming federally listed during the Permit period. This group includes 8 mammals, 4 birds, 4 fish, and 5 amphibians.

Add near end of last paragraph:
For each Lifeform, forest structural classes were assigned as primary and secondary habitat preferences, or as nonhabitat.

Section 3.2.1.1 Northern Spotted Owl:
pg. 231; second paragraph:
Features of the Management Plan
2) Provide spotted owl NRF habitat throughout the Permit period. Plum Creek would maintain those amounts of NRF habitat identified for each decade in Table 24 (at a minimum 8 percent of the its ownership in the Planning Area) as spotted owl NRF habitat.

5) Use only selective harvest on approximately 3,200 acres (64 management units) of NRF habitat.

7) Protect and maintain 10,900 acres in riparian habitat areas (Section 3.3) to provide NRF and FD habitat between upland deferrals on Plum Creek's lands and habitat on Federal lands. This includes ~~5,000~~ 5,600 acres in riparian habitat areas that currently function as NRF ~~and~~ or FD.

8) Demographic and verification surveys would be conducted to evaluate the effectiveness of Plum Creek's harvest deferrals and dispersal corridors in maintaining the viability of ~~the 30~~ spotted owl nest sites identified in the ~~high density "cluster areas",~~ prioritization process for deferrals, and to verify the assumptions of the RSPF model (Section 2.9; Irwin and Hicks 1995).

11) Known sites in the Planning Area would receive ~~seasonal~~ protection within a 0.25-mile radius from March 1 through August 31.

Rationale for Designating NRF Deferrals and FD Corridors

pg. 233; third paragraph, first sentence:

Fifty-seven management units totaling more than 2,600 acres were designated as NRF deferrals. The management units designated for NRF deferral range from ~~9~~ 7 to 105 acres and would remain unharvested for at least 20 years.

Section 3.2.1.2 Marbled Murrelet

pg. 237; changes as shown below:

1) Harvest Deferrals

~~o residual trees in stands exceed 32 inches DBH; and~~

o stands contain 8 trees per acre greater than 32 inches DBH and these large trees are clumped or contiguous across a patch rather than scattered, isolated remnants above a second-growth canopy.

The above criteria regarding the number of large trees per acre was used to determine potential murrelet habitat in lieu of the number of suitable murrelet nesting platforms because of differences in platform measuring methodology between Plum Creek and Washington Department of Fish and Wildlife (Hamer 1995) surveys. Two stands were considered unsuitable murrelet habitat without being field surveyed based on prior knowledge of a professional wildlife biologist experienced in murrelet biology. These stands were considered unsuitable because they either were mistyped and contained small, densely-packed trees or were bisected by railroad and power lines and remaining large trees were scattered, isolated remnants above the existing canopy.

~~o a minimum of two platforms per acre (i.e., large limbs, defects, and mistletoe that could provide nest sites.~~

o confirmation of parameters

pg. 238; changes as shown below:

2) Murrelet Surveys - Plum Creek conducted murrelet surveys on 853 acres in the Planning Area between 1994 and 1995. Of the 853 acres surveyed, approximately 224 acres were on Plum Creek land and 629 acres were on Forest Service ownership.

3) Nest Site Protection

o Suitable habitat would be protected in all directions from an occupied stand until a 100 meter break in suitable habitat is encountered; ~~and~~ or

o An upper limit of 500 acres would be established per nest site. Plum Creek and FWS would cooperatively determine "the best 500 acres," regardless of ownership. Plum Creek would protect their portion of the identified "best 500 acres."

4) **Seasonal Protection -** Plum Creek would, however, protect these "future" murrelet sites in the Planning Area by deferring harvest ~~in the stands~~ within a 0.25-mile radius ~~during the nesting season~~ from March 1 to August 31. Additionally, maintenance of ~~non-declining~~ old growth forests in non-declining amounts on Plum Creek's lands combined with designated critical habitat and riparian conservation areas set...

Section 3.2.1.3 Grizzly Bear:

pg. 239; first paragraph, first sentence:

~~Although grizzly bears may not currently occur in the Planning Area, they may eventually emigrate and reside in the Planning Area.~~

State and Federal agencies agree that grizzly bears occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

pg. 240; second paragraph, second sentence:

Verification would consist of successful denning by grizzly bears in the subunit and/or sightings of ~~female~~ grizzly bears with cubs.

pg. 240; second paragraph:

4) Prohibit Firearms - Within the recovery zone in the I-90 Lakes Subunit, Plum Creek would prohibit firearms in all Company and contractor vehicles, except where firearms are a necessary part of the duties of Company personnel (e.g., law enforcement/security).

Phase II BMPs

pg. 240; add at end of section:

2) Road Location and Construction

Some of the provisions of this BMP would be implemented in Phase I. Watershed analysis and the riparian and wetland strategies, together with the Environmental Principles would likely influence the locations of new roads, and removal of some old roads, so that there would be fewer miles of roads in many sensitive areas in the future. Some habitat categories (e.g., wet meadows and avalanche chutes) would be avoided specifically for grizzly bears beginning in Phase I. Berry fields which are likely to be important for grizzlies would also be avoided whenever practicable. Similarly, saddles are often the most environmentally sound alternative for crossing a ridge with a road. Crossing in other locations might have severe impacts for species relying on talus slopes or other important special habitat type, or might increase the cost of roads to avoid steep slopes and mass-wasting sites. Plum Creek may consider establishing priority areas should some Federal designation effort be initiated. In the meantime, Plum Creek would use its own discretion regarding road location relative to most grizzly bear habitat.

Section 3.2.1.4 Gray Wolf:
pg. 242; first paragraph, first sentence:
~~Although the status of gray wolves in the Planning Area is unknown, wolves may eventually emigrate and reside in the Planning Area during the Permit period.~~

As with the grizzly bear, State and Federal agencies believe that gray wolves occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, Plum Creek believes it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

pg. 243; add changes to the three features of the gray wolf management plan:

2) Provisions for Prey Habitat Conditions -
These prey species are grouped under Lifeform 5, as species which use edges between ~~cover~~ forage (i.e., stand initiation; shrub/sapling; and young forest) and ~~forage~~ cover habitats (i.e., older forest types).

3) Road Management -
Plum Creek has been involved in many cooperative road closures with the Forest Service, WDFW, and DNR, to restrict vehicular traffic to maintain or increase big game security and ~~reduce~~ manage hunting pressure.

Section 3.2.2 Lifeform Management:
pg. 246; last paragraph, switch first and second sentences:
Target goals for percentages of structural stages to be maintained on Plum Creek's land under current regulations and the HCP, to meet the desired suitable habitat estimates for each Lifeform, are shown in Tables ~~25~~ 23 and ~~26~~ 24, respectively. The projected percentage of primary and suitable habitat available for each Lifeform is summarized by decade in the Planning Area ~~with implementation of~~ for current regulations and the HCP in Tables ~~23~~ 25 and ~~24~~ 26, respectively.

Section 3.2.2.5 Lifeform 5:
pg. 250; first paragraph:
(1) "forage" made up of recently harvested areas (i.e., stand initiation; shrub/sapling; and young forest), and (2) "cover" made up of areas with more developed forest conditions.

Section 3.2.2.6 Lifeform 6:
pg. 253; first paragraph:
~~In the absence of natural disturbance such as fire,~~ Although only timber harvest was modeled, many other factors such as fire and natural disturbances, are responsible for creating ~~is the only process to maintain~~ stand initiation, shrub/sapling, and young forest structural stages considered to be primary habitat for this Lifeform.

Section 3.2.2.15 Lifeform 15:
pg. 258; last last sentence:
With implementation of the HCP, early-aged habitat (e.g., stand initiation, shrub/sapling, and young forest) for Lifeform 15 will decrease from 28 percent in 1996 to 11 percent in 2045, while middle-aged (e.g., pole

timber and dispersal forest) and late-aged (e.g., mature forest, managed old growth, and old-growth) habitat will change from 24 percent and 36 percent in 1996 to 42 percent and 35 percent in 2045, respectively.

Section 3.2.2.16 Lifeform 16 (kingfishers, otters, and beavers)
pg. 258; add to heading:

Section 3.3.1 Washington Forest Practices Rules and Regulations:
pg. 260; change as shown below:
The Washington Forest Practices Act (RCW 76.09) and implementing Forest Practices Rules and Regulations (WAC 222~~-08~~) are the principal...

pg. 260; first paragraph, add to end of paragraph:
The intent of this HCP is that compliance with State Forest Practices Rules and Regulations would continue throughout the Permit period. However, it should be noted that WAC 222-16-080-7(a) exempts activities covered under an HCP from the provisions of 222-16-080. State Forest Practices Rules and Regulations, such as road construction standards and minimum leave tree requirements are not intended to be supplanted as a result of implementation of the HCP.

Section 3.3.2 Watershed Analysis:
pg. 261; add new text and table:
Watershed analysis for State and private lands in Washington is a systematic procedure that assesses physical and biological processes within a watershed. This procedure also generates information for developing management guidelines that protect and restore aquatic habitat.

Washington State watershed analysis has seven modules that assess various watershed elements important to fish habitat and water quality (Table 26a). A water-quality module is expected to be added in 1996. The assessment identifies areas sensitive to land management. A prescription team then develops options for operating in and adjacent to sensitive areas to prevent or minimize impacts to aquatic resources. For each prescription team assembled by Plum Creek in the Planning Area, Plum Creek would invite at least one representative from either the FWS, NMFS, WDFW, or local Tribe to participate on the team. In the event such representatives could not participate, a biologist with expertise in fisheries and watershed analysis would be required.

To illustrate situations that are addressed in watershed analysis, a number of common prescriptions from on-going or completed analyses are described below. For areas prone to landslides (e.g., such as inner gorges), road construction and timber harvest are generally prohibited. Intermittent/ephemeral streams on steep slopes with a high potential for erosion are thus protected by riparian buffers that range in size from 30 to greater than 200 feet. Road drainage must be diverted away from steep convergent slopes and landings adjacent to sensitive areas pulled back. Road systems would be evaluated for sediment production and mass wasting potential. Road maintenance and abandonment plans would then be developed to reduce erosion below specified target levels. Management in riparian areas would be customized to site specific conditions and considers the potential for streams: (1) to migrate; (2) to be subjected to debris torrents; (3) to be affected by large woody debris; and (4) to be impacted by future timber harvesting. The objective would be generally to provide late-seral stand conditions (i.e., large diameter conifers) within a half of a site-potential tree height. Harvesting would be typically prohibited

in channel migration zones and within the first 30 feet of the riparian management zone to maintain bank stability and a high level of shade and large woody debris recruitment. In areas where harvesting has the potential to significantly affect peak streamflows, limits would be placed on harvesting until trees reach hydrologic maturity. Landowners are also encouraged to retain canopy cover through partial harvesting.

Watershed analysis would provide the basis for implementing the ecosystem management objectives of the HCP related to aquatic resources. Management objectives related to wildlife resources are addressed in Section 3.2.

Section 3.3.3.1 Interim and Minimum Guidelines for RHAs:

pg. 263; third paragraph, last sentence:

1) **Fish-bearing Streams (DNR Types 1-3) -**
One-time (i.e., one harvest during the Permit period) selective or partial harvests would be allowed in RHAs, if Plum Creek can ensure that post-harvest conditions in the RHAs would provide, at a minimum, the equivalent of spotted owl habitat (i.e., FD habitat or greater). These harvests would incorporate removal of no more than 50 percent of the merchantable (i.e., commercial) timber volume available for harvest in the 200-foot RHA. Intermittent streams found to be fish-bearing would receive special consideration under watershed analysis.

pg. 263; add as last paragraph:

Type 4 and Type 5 streams with a high likelihood of fish presence or near the confluence of a Type 3 stream would be tested prior to harvest to verify presence or absence of fish to ensure the proper buffers are utilized. Additionally, if a fish-bearing stream has a blockage and the source of the blockage is removed, the stream up to the nearest natural blockage would be treated as a fish-bearing stream.

pg. 264; first paragraph:

2) **Nonfish-bearing, perennial streams (DNR Type 4) -** Along perennial streams within Federal Late-Successional Reserves, Adaptive Management Areas, and where elevation and topography are suitable for owl dispersal, Plum Creek would provide 100-foot RHAs on each side of these streams. In addition, watersheds east of the Cascade crest containing 303(d) streams and/or bull trout or anadromous fish would receive 100-foot RHAs along perennial streams above 5,000-foot elevation and outside of Late-Successional Reserves and Adaptive Management Areas. Also, ground-based equipment is prohibited in the 30-foot zone nearest the stream for all RHAs.

pg. 264; third paragraph:

In perennial, non-fish bearing streams that may be susceptible to landslides or debris flows (e.g., inner gorge topography), appropriate sized riparian buffers would be determined through watershed analysis. ~~Intermittent streams found to be fish-bearing would recieve special consideration under watershed analysis.~~ In the interim, State Forest Practices Rules and Regulations preclude harvest and road construction on slopes at risk of failure.

Section 3.3.4 Harvest Deferrals for 303(d) Stream Segments and Wetland Management Zones:

pg. 271; next to last sentence:
...watershed analysis is completed in each watershed (Figures 23 and 27), and within ~~1,150~~ 1,320 acres in wetland management zones (WMZs) surrounding wetlands (Section 3.3.4). Currently listed 303(d) streams are being provided with a 100-foot RHA on Type 4 streams. Watershed analysis will address the water quality parameters typically impacted by forest practices such as stream temperature, turbidity, and sediment input.

Table 28. Approximate miles and percentage of DNR stream types within each riparian protection strategy by ownership in the Planning Area.
pg. 270; Change the Table to reflect the increase in miles of streams with 100-foot buffers on Type 4 streams in LSR and AMA. Stream type under Plum Creek Timber Company, L.P.; change 152 under 100 ft. RHA to 165, and change 24 under 25 ft RLTA to 11.

Section 3.3.5 Aquatic Resources Monitoring:
pg. 272; change as shown below:
2) Analyze the effects of the various riparian habitat areas (RHAs) management strategies on ~~steam~~ stream temperatures.

Section 3.4.1 Wetlands:
pg. 273; change as shown below:
The riparian wetlands would be identified during watershed analysis and appropriate prescriptions to protect the functions and values of these wetlands would be developed. Most of the wetlands within the Planning Area are spatially and functionally associated with rivers and streams. Other wetlands may occur more or less in isolation. These isolated wetlands are generally small, but may have unique characteristics and provide habitat for numerous wildlife species. Plum Creek would implement, as minimum and interim guidelines, ~~the Riparian Management Strategy and~~ standard State Forest Practices Rules and Regulations and the Riparian Management Strategy to protect all wetlands.

Forest Practices Rules and Regulations and watershed analysis may provide adequate protection of wetland features such as water quality, temperature, and some associated wildlife species (e.g., amphibians), however, they may not be adequate to protect all wetland-dependent species. Species such as cavity-nesting ducks would benefit from larger buffers as would be provided by the Proposed Action for nonforested wetlands and bogs greater than 5 acres in size (see below).

pg. 273; change as shown below:
3.4.1.1 Buffer Size and Shape
The Forest Practices Rules and Regulations require buffers, termed wetland management zones (WMZs), on all Type A wetlands and on most Type B wetlands. These regulations would be followed for wetlands less than 5 acres in size. ~~For Type A wetlands greater than 5 acres in size, Plum Creek would retain an average WMZ width of 100 feet.~~ For Type A wetlands between 0.5 and 5 acres, Plum Creek would retain a 50 foot average WMZ. ~~For Type B wetlands greater than 5 acres, Plum Creek would retain an average WMZ of 50 feet,~~ and for Type B wetlands between 0.5 and 5 acres the WMZ retained would be a minimum of 25 feet.

Nonforested wetlands and bogs greater than 5 acres would recieve a 100-foot minimum and 200-foot average buffer width because of the greater seasonal persistence of open water, seasonal and spatial

variation, and year-to-year variation.

pg. 274; change as shown below:

3.4.1.2 Additional Wetland Treatments

Although forested wetlands have fewer restrictions on timber harvest than nonforested wetlands, they have special rules designed to protect wetland soils. Cable systems are allowed in forested wetlands, but tractors, wheeled skidders, and other ground-based logging systems may be used only when soil moisture is low or the ground is frozen. At all times equipment use must minimize compaction or disturbance of the soils. Where possible, forested wetlands would be left in a forested condition (i.e., retain a canopy closure of 30 percent).

Plum Creek would allow only one entry every 50 years to each wetland buffer. Where wetlands are located outside of, but associated with, riparian areas, such as off-channel habitats or where they are located in association with unstable slopes; the minimum buffer width may be waived, after consultation with the Services, in favor of a redirected effort to more appropriately distribute the buffer trees to link these critical habitats. All wetlands which are an integral part of the stream system would receive the appropriate RHA, RLTA, or other treatment as directed by the Riparian Management Strategy. The Services have recommended that harvest unit leave trees should be clumped in proximity to all small wetlands when such options exist and do not conflict with higher-priority ecological objectives.

Residual Trees. The size and number of leave trees for wetland buffers are specified in the State Forest Practices Rules and Regulations. In addition to these specifications, the leave trees would be representative of pre-harvest tree sizes and species.

Road Building and Equipment Exclusion. In planning roads and landings, Plum Creek will comply with State Forest Practices Rules and Regulations and attempt to avoid wetlands. If wetlands cannot be avoided, Plum Creek will maintain natural drainage and reduce impacts by minimizing subgrade width and spoil areas. If Plum Creek is unable to minimize impacts, the Company would restore affected areas, reduce impacts, or replace affected wetlands as specified by State Forest Practices Rules and Regulations. Also, if a particular road segment necessitates filling or draining more than 0.5 acres of wetland, the Company would compensate for that fill (or drainage) by creating new wetlands or by enhancing existing wetlands.

The area adjacent to the edge of a wetland would be maintained free from ground-based equipment. This would avoid direct impact to amphibians and other wetland edge-dependent species and prevent compaction of soil and interstitial spaces in the substrate. In addition, ground-based equipment would not be allowed in the following areas:

1) Within a nonforested wetland;
2) Within 25 feet of a nonforested wetland edge, where the wetland exceeds 0.5 acres; and
3) Within 25 feet of an open water area associated with a forested wetland, where the wetland exceeds 0.5 acres.

Section 3.4.2 Talus Slopes:

pg. 274; first paragraph, third sentence:

Although these areas represent a relatively small portion of the landbase in the Planning Area, they are

important special habitat which ~~maybe~~ may be adversely affected by road construction and timber activities.

pg. 275; last sentence:
Residual large green trees and snags would be left within 100 feet of the sites. Where possible the objectives of maintaining shade and providing a source of course woody debris would be met.

Section 3.4.3 Caves:
pg. 275; change as shown below:
The Services' definition of a cave includes, naturally occurring cavities or recesses large enough to contain a human (interpreted as a 2 foot by 2 foot opening with at least 4 feet of depth), with attributes of high humidity, stable temperature (interpreted such that the opening:passage relationships are either cylindrical or the opening is restricted, or depth of the cave is significantly deep so that air does not flow freely to and from the outside causing desiccation and rapid temperature changes in the cave), and has a zone characterized by darkness and silence (dripping or running water is an exception). Caves with known maternal colonies or hibernacula for significant numbers of bats would meet minimum size and shape requirements. If cave passages are sufficiently below the ground surface, road building may be permissible directly above the passages. If passages are shallow, recommendations for road building and equipment may be warranted in areas above and immediately adjacent to those passages.

There are currently no known caves in the Planning Area. If a cave is discovered in the Planning Area, Plum Creek would notify the Services. It would be the responsibility of the Services, in conjunction with the State Department of Fish and Wildlife, to map the cave and recommend prescriptions to avoid compromising the integrity of the cave passages. Plum Creek would reduce the potential for impacts by establishing a buffer around the entrance to caves. This buffer would be designed around site-specific conditions, but would not be less than 100 feet from the entrance of the cave. The 100-foot buffer would be managed, if adequate trees and size classes are available, to approximate FD habitat similar to that prescribed for the 100-foot riparian buffers.

Many species of wildlife including Townsend's big-eared bats roost almost exclusively in cavities and caves, both man-made and natural. Potential impacts to bats and other species may include disturbance of caves used for hibernation, denning, or other activities. Additional steps to protect known hibernation or denning caves includes prohibition of human disturbance near the entrance of caves, and elimination of the spraying of herbicides or fertilizers within 100 feet of caves. A managed buffer of this size was developed in conjunction with the Services and is considered adequate to maintain stable temperature and relative humidity in adjacent caves and to address the biological needs for most, if not all, cave-dependent species. It is important to note that it is not the intention of Plum Creek to buffer every depression, hole, or fissure found in rock outcrops. Rather, Plum Creek would protect all caves discovered which are sufficiently deep and narrow of opening that provide a stable environment for cave-dependent species.

Section 3.4.4 Snags and Snag Recruitment Trees:
pg. 276; add as last paragraph:
Hollow snags have been identified by the Services as important habitat for swifts, fisher, and marten. Although hollow snags are relatively rare in comparison with similarly sized solid snags, they would be

given high priority for retention at all sites. However, if these or any other standing snags present a safety hazard, they would be felled and either left in place or removed.

Section 3.4.5 Seeps and Springs:
pg. 276; add as new section:
Seeps and springs represent areas transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is covered periodically, by shallow water. Although these special habitats may be small and difficult to locate, they may have unique characteristics and provide habitat for specialized plants and animals not provided elsewhere in riparian areas. Foremost among the wildlife species that depend upon these special habitats (e.g., mineral springs) is the band-tailed pigeon (*Columbia fasciata*). During the breeding season (i.e., April through September) the main population of these birds occurs below 1,000 feet elevation in western Washington forests exhibiting good interspersion of seral stages and openings, abundant food resources, and mineral springs (Sanderson 1977). Band-tails are known to seek sources of mineral salts necessary for the production of "crop milk" for feeding young birds (Sanderson 1977). The most common sources of these minerals are from mineral springs and brackish water in estuary tide channels (Sanderson 1977). In late summer, these birds move into higher elevations in response to the increasing availability of fruits and berries. By late September most band-tails depart for southern wintering areas (Jeffrey 1989).

To prevent or reduce impact to these habitats and wildlife species that depend upon them, such as the band-tailed pigeon, Plum Creek would implement, as minimum and interim guidelines, the Riparian Management Strategy and standard State Forest Practices and Regulations. The biological objectives are to protect and maintain the integrity of known seeps and mineral springs, while retaining trees adjacent to these habitats to maintain water quality, provide shade, and provide downed logs for forage and shelter. Activities within 200 feet of mineral springs would be coordinated with the Services and designed to retain adequate trees for perching, and to maintain berry, fruit, and mast-producing shrubs and trees which provide food sources, particularly in openings in proximity to the mineral springs (Roderick and Milner 1991). Trees designated for harvest in proximity to seeps and mineral springs would be felled directionally away from these habitats. Skidding and yarding activities would be avoided and all ground-based logging equipment would be prohibited from entering these habitats. Residual large green trees and snags within 25 feet of these sites would be left, and either clumped or scattered depending upon operational feasibility. In addition, under corporate Environmental Principles, Plum Creek voluntarily minimizes its use of herbicides, and the Company exceeds State Forest Practices Rules and Regulations by prohibiting spraying in riparian areas, and by not allowing spraying within 100 feet of water bodies.

Section 3.4.6 Ponderosa Pine Stands:
pg. 276; add as new section:
Plum Creek utilizes selective harvesting in Ponderosa pine stands where such techniques are operationally and silviculturally appropriate. Continued use of selective harvesting would result in multi-aged stands over the Permit period. Table 30b (added to HCP Section 3.5.3, see FEIS Appendix 4) presents an analysis of stand structural stages within the Ponderosa pine/Lodgepole pine forest class (Jensen 1995) for the HCP during the Permit period. Where development of a multi-aged forest is not possible, Plum Creek would enhance opportunities for biological diversity by leaving trees of various

size classes, as well as existing snags and snag recruitment trees.

Section 3.5.1.1 Northern Spotted Owl:
pg. 277; first paragraph, second sentence:
~~Death or~~ Direct injury to owls as a result of forest management is not anticipated.

pg. 277; first paragraph, fifth sentence:
In addition, the mitigation measures described in this HCP are designed to: (1) avoid ~~the likelihood of~~ injury to spotted owls; (2) protect habitat; and (3) facilitate dispersal of adult and juvenile owls.

pg. 280; change as shown below:

2) Distribution of spotted owl habitat through the Permit period -
For example, WD-40 (Figure 9) is expected to contain more NRF (i.e., 48 percent) than the other DCAs, whereas, WD-7 is expected to contain the least NRF (i.e., 20 percent). Overall, at year 50, DCAs are estimated to contain more NRF habitat (i.e., 38 percent) than the Planning Area as a whole (i.e., ~~25~~ 26 percent).

pg. 284; change as shown below:

4) Dispersal habitat
As discussed above, dispersal habitat is projected to ~~more than double~~ increase from 20 to 35 percent in the ~~HCP~~ Planning Area over the Permit period.

pg. 285; change as shown below:

5) NRF habitat patch sizes
Plum Creek would strive to manage patches in such a way as to maximize patch size. Plum Creek has not committed to large minimum patch sizes; however, the Company's intent is to manage in such a way that harvest-units might be located near recently harvested areas to the extent allowed by State Forest Practices Rules and Regulations. This would facilitate periods of activity in subbasins, followed by periods of inactivity during which time roads could be closed or abandoned. Another benefit of this management is that these harvested areas would be of similar age and, after a number of years, would start to represent larger blocks of older forest.

Section 3.5.1.2 Marbled Murrelet:
pg. 290; last sentence:
Plum Creek's overall strategy for murrelets would be avoidance and minimization of take.

Section 3.5.2.1 Reptiles:
pg. 297; third sentence:
Specifically, habitat for this species will be addressed through 30-foot, no-harvest zones along all fish-bearing streams, and 100-foot RHAs with 30-foot, no-equipment zones along permanent, nonfish-bearing streams and larger wetlands.

Section 3.5.2.2 Amphibians:
pg. 297; first paragraph, third sentence:
For example, some amphibians breed only in high ~~elevation~~ gradient mountain streams...

Tailed Frog
pg. 297; first paragraph:
...LWD guidelines and 100-foot RHAs with 30-foot, no-equipment zones on each side of permanent, nonfish-bearing streams (DNR Type 4) will meet the biological needs of this species.

Northern Red-Legged Frog
pg. 297; first paragraph:
Designation of 30-foot, no-harvest buffers along fish-bearing streams (DNR Types 1-3) and 30-foot, no-equipment zones within the 100-foot RHAs on permanent, nonfish-bearing streams (DNR Type 4) on Plum Creek's lands and RCAs on Federal lands,...

Cascades Frog
pg. 298; first paragraph:
Additional habitat for this species that may occur in commercial harvest areas will be addressed through 30-foot, no-harvest buffers within the 200-foot RHAs along fish-bearing streams (DNR Types 1-3) and 30-foot, no-equipment zones within the 100-foot RHAs on permanent, nonfish-bearing streams (DNR Type 4)...

Spotted Frog
pg. 298; first paragraph:
Implementation of the HCP would provide RHAs with 30-foot, no-harvest buffers and additional partial harvest zones along fish-bearing (DNR Types 1-3) streams and additional LWD retention areas and 30-foot, no-equipment zones on perennial nonfish-bearing streams. The wetlands strategy also provides additional retention in buffers, no equipment zones around certain nonforested wetlands, and wider buffers on larger wetlands.

Larch Mountain Salamander
pg. 299; first paragraph:
Plum Creek will also reduce the impact to potential habitat near caves by establishing a ~~25-foot~~ 100-foot buffer around the entrance to caves.

Section 3.5.2.4 Birds:
pg. 300; first paragraph:
Harlequin Duck
Provision for 100- to 200-foot RHAs (with 30-foot, no-harvest zones on fish -bearing streams, and 30-foot, no-equipment zones on nonfish-bearing streams)...

Northern Goshawk:
pg. 301; add changes as shown below:
1) **Harvest Deferrals-** Timber harvest in the ~~five~~ six management units which currently contain goshawk sites would be deferred for at least 20 years.

2) **Habitat Management-** Goshawks use all spotted owl habitat types (i.e., NRF and FD), ~~as nesting habitat~~ with some nesting occurring in both habitat types. As a result of implementation of the HCP, goshawk nesting habitat (i.e., primary habitat approximates NRF and secondary

habitat approximates FD; therefore, "suitable" habitat is roughly equivalent to NRF habitat plus one-half FD habitat)...

3) **Seasonal Restrictions** - For additional nest sites that may be found ~~on Plum Creek's land~~ in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25 mile radius ~~until after the nesting season is concluded~~ from March 1 until August 31.

Bald Eagle
pg. 304; add to end of last paragraph:
Bald eagle site-protection plans will not only include nest sites, but associated foraging areas and pilot trees. Winter concentration areas and communal roost sites will be protected from disturbances during the season of use.

Peregrine Falcon
pg. 305; add to beginning of last paragraph:
Protocol surveys will be performed prior to harvest or road building within 400 meters of a potential eryie (i.e., a rock cliff vertical face greater than 150 feet).

Vaux's Swift
pg. 308; add before last sentence:
The leave tree retention strategy places special emphasis on large hollow snags.

Section 3.5.2.5 Mammals:
pg. 309; pg. add at next to last sentence:
Townsend's Big-eared Bat
This buffer will be designed around site-specific conditions, but will not be less than ~~25~~ 100 feet from the entrance.

Section 3.5.3 Associated Species (Lifeforms):
pg. 312; change as shown below:
As a means of quantifying the habitat conditions used by species grouped into each of the Lifeforms, wildlife use patterns among the eight forest stand structural stages (Figures 46 through 48) and special habitats ~~(Table 30)~~ were tallied and summarized by decade in the Planning Area with implementation of the HCP (Table 30) and current regulations (Table 30a) (see Lundquist and Hicks 1995; Lundquist et al. 1995). An analysis of the stand structural stages within the forest classes (Jensen 1995) for the HCP is presented in Table 30b.

Section 3.5.3.5 Lifeform 5:
pg. 320; add to end of Section:
Although there is a decrease in the amount of edge habitat expected by year 2045, it is expected that 62 percent of the area would be within a 0.5-mile radius of a distinct edge. This remains a substantial amount of habitat for Lifeform 5 species in the Planning Area. Road closures in selected areas would increase habitat availability for some Lifeform 5 species such as elk and deer, thereby decreasing their vulnerability to legal and illegal harvest.

Section 3.5.3.6 Lifeform 6:

pg. 321; add after second paragraph:

Additional emphasis was placed upon the discussion of the impacts to this Lifeform to ensure that species within Lifeform 6 would be adequately addressed. The overall emphasis of the HCP is in many ways counter to the generalized habitat needs of Lifeform 6. The HCP strives to provide more mature forest adjacent to riparian and wetland areas to address species other than those in Lifeform 6. Because the projected amounts of primary habitat (i.e., SI, SS, YF within riparian and wetland areas) appears to decrease to low levels, the Services believed that a closer examination of the habitat needs of Lifeform 6 species was warranted.

pg. 321; third paragraph, second sentence:

The expected decrease is due to the modeled reduction in timber harvest activity anticipated within RHAs across all ownerships in the Planning Area, as a result of management focused on other species (e.g., northern spotted owl), which requires retention of later structural stages of forest development. ~~Aside from~~ Although natural disturbance such as fire, blowdown, disease, flooding, and insect infestations ~~timber harvest is the only process that would~~ could produce substantial acreage of Stand Initiation, Shrub/Sapling, and Young Forest stages, these stochastic events and the occurrence of yarding corridors were not modeled in the habitat analyses. Non-timbered areas (e.g., wet meadows) also were not considered in the modeling, although these areas may be used by many Lifeform 6 species. Consequently, estimated levels of primary habitat for Lifeform 6 species may have been underestimated in the analysis. ~~It should be noted that the habitat analysis did not factor non-timbered or non-habitat areas and periodic disturbances into the modeling. Although not modeled in the analysis, natural disturbances are likely to occur in the Planning Area during the Permit period and could create openings conducive to species in this Lifeform.~~

pg. 322; delete third sentence in the fourth paragraph:

~~Such species as Townsend's solitaire, would be affected due to the anticipated reduction in edge habitat during the Permit period.~~

pg; 322; add to fifth paragraph, after first sentence:

Orange crowned warblers are commonly associated with young stands of most forest types, dense shrubby thickets, forest openings, and forest edges, and would likely continue to use early structural stages outside of the riparian areas. Townsend's solitaire, may also be affected due to the anticipated reduction in edge habitat during the Permit period. During the Permit period, early-structural stages are expected to decrease throughout the Planning Area, though not as sharply as within the RHAs (Table 30).

Section 3.5.3.13 Lifeform 13:

pg. 327; changes as shown below:

Because of differing needs among the species for snags of suitable size, this Lifeform was partitioned into two subgroups, "13", and "13a". Primary habitat for ~~the majority of each species~~ Lifeform 13 was considered to be the later structural stages (i.e., dispersal forest through old-growth). ~~and secondary habitat included young forest and pole timber (after 20 years), and stand initiation and shrub/sapling (after 10 years when stands with greater structural diversity (e.g., live and dead tress) are mor dominant in the Planning Area (Table 15).~~ Secondary habitat includes young forest and pole timber and recently harvested areas.

Several species, including the pileated, white-headed, and Lewis" woodpeckers, were included in subgroup 13a. For purposes of evaluating habitat conditions through the Permit period, ~~the latter~~ primary habitat for this group ~~was considered to have primary habitat affinity among the later structural stages (mature through old growth)~~, includes only mature forests, managed old-growth, and old-growth which have larger snags in densities sufficient to support these species. ~~with secondary habitat accurring as~~

~~the younger structural stages (Table 15)~~. Secondary habitat includes young forest and pole timber (after 20 years), and stand initiation and shrub/sapling (after 10 years when stands with greater structural diversity (e.g., live and dead tress) are more dominant in the Planning Area (Table 15).

pg. 328; fifth paragraph, first sentence

State Forest Practices Rules and Regulations in western Washington (without benefit of the HCP) require retention of an average of at least three standing dead or defective live trees (greater then 12 inches DBH and greater than 10 feet tall), two live recruitment trees (greater than 10 inches DBH and greater than 30 feet tall), a...per acre of harvest. In eastern Washington only two standing dead or defective live trees are required.

Section 3.5.3.15 Lifeform 15:

pg. 332; add to end of Section

Lifeform 15-early habitat (Table 15) decreases from 28 percent of the Planning Area in 1996 to 11 percent in 2045 (Table 25). Although this represents a decrease from current amounts, it may still be substantially more than would occur under natural conditions. Some of the species in this category may experience population fluctuations or decreases from current levels. These species should be adequately addressed due to the continued provision of early-successional and nonforested habitat in the Planning Area. Other species in this category may have requirements which further limits their available habitat. For example, a species requiring early-successional habitat in the Douglas-fir/Grand Fir zone (Table 30b) may have much less habitat available than if it could use early-successional habitat in any forest type. Stand structures projected for the five coniferous forest types and for deciduous forest types indicate that early-successional habitat would continue to be available in all forest types, but may be decrease slightly through time.

Section 3.6.1 Spotted Owl:

pg. 341; change as shown below

2) **NRF Maintenance (MC) -**Plum Creek will maintain target percentages for NRF habitat for each decade of the Permit period (Table 24), and at...

3) **NRF Deferrals (MC) -** 2,600 acres of current NRF habitat will be deferred from harvest for at least 20 years...

pg. 342; change as shown below:

~~6)~~ ~~**Demographic Surveys -** Plum Creek would monitor occupancy at 30 spotted owl sites in the Planning Area where habitat has been retained to maintain the sites for 20 years.~~

6) **Model and Deferral Validation Surveys** - Plum Creek would conduct surveys in portions of the Planning Area to validate the RSPF model predictions of spotted owl habitat suitability during the Permit period and the effectiveness of deferrals at selected spotted owl sites. Survey methodology will be determined with the FWS.

9) **Seasonal Protection** - Known owl sites in the Planning Area would receive ~~seasonal~~ protection within a 0.25-mile radius from March 1 through August 31.

Section 3.6.2 Marbled Murrelet:

pg. 342; change as shown below:

12) **Murrelet Nest Site Protection (MC) -**
Additional murrelet sites discovered by qualified surveyors during the Permit period ~~on Plum Creek's land~~ in the Planning Area would be protected ~~during the current nesting season~~ by deferring harvest in the stands within a 0.25-mile radius during the nesting season from March 1 to August 31.

Section 3.6.3 Grizzly Bear:
pg. 342; change as shown below:

14) **Phase I BMP's (MC) -**
Upon approval of the HCP, Plum Creek would implement a series of Best Management Practices (BMPs) within the recovery zone in the I-90 Lakes Subunit.

Section 3.6.5 Other Species:
pg. 343; change as shown below:

17) **Goshawk Nest Protection (MC) -** Plum Creek would defer harvest of 274 acres of habitat currently supporting goshawk sites on Plum Creek's land, for at least 20 years (Section 3.5.2.4). For additional nest sites that may be found in the Planning Area during routine harvest planning and layout, harvesting would be delayed within a 0.25 mile radius from March 1 until August 31.

Section 3.6.7 Riparian Management:
pg. 344; add the following to subunit 1:

26) **Riparian Habitat Areas**
(1) **In Federal LSRs and AMAs:** 200-foot RHA on fish-bearing streams with 30-foot, no-harvest zone; 100-foot RHAs on perennial, nonfish-bearing streams up to 5,000 feet elevation; a 30-foot, no-equipment zone and an additional 100-feet RHA for "sensitive reaches"; and 25-foot RLTAs on nonfish-bearing streams above 5,000 feet elevation.

Section 3.6.8 Special Habitats:
pg. 345; change as shown below:

32) **Caves -** Forested buffers will be left for a minimum of ~~25~~ 100 feet from cave entrances to protect bats and other species of wildlife. Site-specific analysis would follow in cooperation with the Services.

NOTE: After printing the first edition of the HCP, it was discovered that pages 347 and 348 had been printed on duplicate pages. In subsequent editions of the HCP, the duplication of these two pages was eliminated. Thus, there is a two page discrepancy between some versions of the HCP. To make the following changes easier for all reviewers regardless of the edition of the HCP they may have, the appropriate page numbers for both versions of the HCP are provided.

Section 5.1.2 Spotted Owl Monitoring
pgs. 357/359; changes as shown below:

Purpose
Spotted owl monitoring would be conducted to ~~evaluate the effectiveness of Plum Creek's harvest deferrals in maintaining the viability of the 30 spotted owl nests identified in the high density "cluster areas," and to~~ verify the assumptions of the RSPF model (Irwin and Hicks 1995) and verify the effectiveness of selected harvest deferrals in maintaining site occupancy.

Scope
~~Demographic surveys to reestablish contact and to locate spotted owl nest sites in "cluster areas" would be completed for 2 years prior to major reporting dates (Table 31). These cluster sites are located in the~~

~~AMA and LSR portions of the Planning Area.~~ Model and deferral validation surveys would be conducted in 10 to 15 percent of the Planning Area to reestablish contact and locate all spotted owl nest sites in areas sampled. Survey areas would be distributed in LSR, AMA, and Matrix landscapes within the Green River, I-90 Lakes, and Taneum subunits of the Planning Area. Survey methodology will be determined with the FWS and will incorporate a two-visit survey sequence each season (i.e., about May 1 to June 30), surveying of likely habitat, and use of appropriately distanced calling stations (i.e., 0.25- to 0.5-mile distance between calling stations). Spotted owl sites within the survey areas which were targeted with deferrals will be monitored for occupancy for the duration of the deferral period. Approximately 16 deferrals which support 9 sites are encompassed by currently established survey areas. Sites discovered during surveys would be checked later in the season to determine nesting success/productivity. As additional owls are located, they may be banded, at the discretion of Plum Creek, to facilitate identification upon later sightings.

By combining the RSPF model with results of the spotted owl monitoring and GIS information, Plum Creek ~~should~~ would be able to determine the "carrying capacity" or the number of owls the forest habitat ~~should be~~ is capable of supporting at any time through the 50 year term of the HCP, or such shorter term if terminated sooner, pursuant to the IA (i.e., the "Phase I").

Frequency
The demographic data would be gathered for two seasons prior to reporting years 2, 10, 15, 20, and 40 (Table 31) ~~the end of each reporting period~~.

Section 5.1.4 Grizzly Bear Monitoring:
pgs. 358/360; changes as shown below:
~~Although grizzly bears may not currently occur in the Planning Area, they may eventually emigrate and reside permanently in the Planning Area~~.

State and Federal agencies agree that grizzly bears occur, at least occasionally, within the Planning Area. Historical and recent observations in the north and central Cascades also indicate that grizzly bears may be slowly extending their southern range. However, at present there is insufficient information to confirm the extent to which grizzly bears use the Planning Area.

Section 5.1.5 Gray Wolf Monitoring:
pgs. 358/360; changes as shown below:
~~Although the status of gray wolves in the Planning Area is unknown, there is a high probability that gray wolves would eventually emigrate and reside in the Planning Area during the Permit period~~.

As with the grizzly bear, State and Federal agencies believe that gray wolves occur, at least occasionally, within the Planning Area. Although available information on the distribution of gray wolves in the north and central Cascades is not as extensive as for other wildlife species, Plum Creek believes it is reasonable to assume that gray wolves would eventually reside in the Planning Area during the Permit period.

Section 5.1.6 Aquatic Resources Monitoring:
Objective 1: Provide landscape-wide monitoring of habitat conditions over the Permit period.
Method 2

pgs. 361/363; add as last paragraph:

Monitoring and research is another vital component of watershed analysis and is consistent with an adaptive management strategy. Watershed analyses are revisited every five years to make appropriate changes in prescriptions based on monitoring data or advances in scientific understanding. Examples of monitoring and research done as a result of watershed analysis include: (1) a road sediment production study; (2) McNeil sampling of streams to assess fine sediment levels; (3) installation of two stream gages; (4) testing of digital elevation hydrologic models; (5) stream temperature monitoring; and (6) stream surveys to evaluate channel changes and large woody debris levels. If data indicates that prescriptions are not effective or inadequate, changes in the prescriptions would be made.

Section 5.1.6 Aquatic Resources Monitoring:

Objective 2: Analyze the effects of the various riparian habitat area (RHA) management strategies on stream temperature

Method 1

pgs. 362/364; added to end of third paragraph:

Temperatures will be monitored for ~~2~~ 5-years, during the period July 1 through September 15 (Table 31). Two years of monitoring will occur prior to riparian treatments and three years post-treatment. In the event that summer temperatures are unusually low or data are deemed insufficient to draw conclusions about the effectiveness of the various riparian management strategies, monitoring will be extended beyond the 3-year post-treatment period. During this period, stream temperatures would be recorded hourly. It is important to point out that this temperature monitoring would be in addition to the stream temperature monitoring that would be conducted as a part of watershed analysis.

pgs. 362/364; added to end of fourth paragraph:

This study would focus on potential changes in annual maximum temperatures. Adaptive management (Section 5.4.3) would be used to evaluate the success of Plum Creek's RHAs in achieving stated ecological goals.

pgs. 363/365; delete Method 2 paragraph (it has been added to Objective 1):

~~Site-specific monitoring as a result of watershed analysis will be conducted over the Planning Area. For example, McNeil streambed samples will be taken to monitor a fine sediment production study for a road network in the Taneum Creek watershed, and during a hydrological study investigating how forest management activities on the east side of the Cascades can affect streamflow.~~

pgs. 363/365; change method numeration to reflect the above change:

Method ~~3~~ 2

Objective 3: Assess fish populations in the context of recovery of habitat conditions in Cabin Creek

pgs. 364/366; last sentence:

Plum Creek would conduct fish population surveys during the Years 1,2,3,4,6,8,10, and then, every 10-years thereafter, during the HCP Phase. Adaptive management (Section 5.4.2) would be particularly important if monitoring detects trends which may require corrective actions.

Objective 4: Assess the biological integrity of streams in the Planning Area over the Permit period

pgs. 364/366; last sentence:
~~Three stations in~~ Two to three samples in two riffles will be collected from the Little Naches River, ~~and~~ Cabin Creek, and Snow Creek during ~~will be monitored during July and~~ September. Sampling once a year with multiple samples per riffle is an effective sampling strategy if conducted in a consistent manner (Jim Karr, pers. comm., Univ. of Washington). Samples would be collected in Years 1,2,3,4,6,8,10, and then, every 10-years thereafter, during the HCP Phase. Additional sampling may be done as part of watershed analysis monitoring or after disturbances in the watershed. The adaptive management approach (Section 5.4.2) would provide a feedback mechanism to evaluate monitoring data and a basis for determining if corrective actions are necessary.

Section 5.3.1 Unforeseen Circumstances:
pgs. 371/373; add to end of Section:
In the event of Unforeseen Circumstances, the Services and Plum Creek would discuss the situation and possible remedies. A number of possible remedies would be explored in succession. Remedies first explored would be those which could be accomplished through the use of flexibility or adaptive management. In the event that those actions are not practicable or are not acceptable to either party, the Services or Plum Creek may suggest an amendment. An amendment is possible at any time under this agreement if it is mutually agreeable to both parties. If an amendment is not possible, the Services may seek to obtain additional conservation or mitigation from Federal lands. The Services would also be permitted to pursue any other avenues within their means. However, the Services would be unable to impose additional mitigation upon Plum Creek except under Extraordinary Circumstances, as defined in the Implementation Agreement and discussed in the following section.

Section 5.3.2 Extraordinary Circumstances:
pgs. 372/374; add to end of Section:
The Services may need to recommend an amendment to reallocate the level of conservation among species and habitats to avoid jeopardizing a species while avoiding imposing additional financial constraints on Plum Creek. If Plum Creek does not agree with the terms of the additional mitigation proposed by the Services, Plum Creek may terminate the Permit with respect to one or more species under the terms and conditions set forth in Section 11 of the Implementation Agreement.

5.3.3 Safe Harbor (Phase II)

5.3.3.1 Background
Plum Creek believes that implementation of the HCP may result in increases in populations of listed species on its lands, particularly if more or better habitat for listed and unlisted species is voluntarily provided in the Planning Area than was projected at the outset. If so, the incentive for any landowner, absent any special provisions, would be to reduce habitat to levels projected for the end of ~~the HCP~~ Phase I of the Permit, particularly if Federal law at that time provides that ~~prohibited~~ habitat modification or disturbance~~s as~~ may be a form of incidental take of listed species. Plum Creek believes that it is in the best interest of the Company and listed species to have a positive incentive to attract and maintain species and to improve wildlife habitat during and beyond ~~the HCP~~ Phase I of the HCP. To address these concerns, Section 12 of the IA (Appendix 10), provides for a second phase. ~~"Safe Harbor" after the HCP Phase.~~

This second phase of the HCP is modeled after the "Safe Harbor" concept. It is designed to provide an

incentive to maintain habitat. It is undesirable for landowners to manage their lands to avoid providing wildlife benefits out of fear for additional regulatory requirements. Similar to the "Sandhills Agreement" (FWS 1995), the landowner would continue to avoid or minimize "direct take" and reproductive-season impacts. So long as the Baseline (defined below) is met or exceeded, any subsequent incidental taking will be authorized by the section 10(a) permit.

Unlike the "Sandhills Agreement", the voluntary contribution of habitat under this HCP is not measured against the current Baseline. This is related to the delayed implementation of the "Safe Harbor" concept in this case. Also, in the event of early termination of this HCP, the Baseline would be more restrictive than provided in the "Sandhills Agreement". For these reasons, the term Phase II is used to describe the "Safe Harbor" concept provided in this HCP.

To the extent that habitat conditions exceed the ~~Safe Harbor~~ Baseline described below for a species, the Permit would continue after ~~the HCP~~ Phase I to authorize incidental take of certain Permit wildlife species and other wildlife species that become listed and are associated with that habitat for up to an additional fifty (50) years (hereinafter "~~Safe Harbor~~ Phase II"), or until the habitat defined as the voluntary contribution is reduced to the Baseline.

~~If the HCP Phase I terminates at the end of the 50 year period, the Safe Harbor Baseline will be defined as the amount of habitat projected by Plum Creek to exist at year 50 as described in this document, as the same may be amended from time to time. If the HCP Phase I ends prior to the end of the 50-year period, the Safe Harbor Baseline will be defined as the greater of the amount of habitat existing at the beginning of the HCP Phase I or that amount projected to exist at the time of termination at year 50. Habitat in excess of the Safe Harbor Baseline for a species will be available for harvest during the Safe Harbor~~ Phase II is subject to the requirements for minimization and mitigation presented below under the heading **Baseline**. ~~in the IA to minimize incidental take, and the Permit will continue to authorize incidental take until the habitat defined as the voluntary contribution under such Safe Harbor is reduced to the Safe Harbor Baseline.~~ During ~~the Safe Harbor~~ Phase II, Plum Creek will report the status of the ~~Safe Harbor Baseline~~ subject habitat parameters (e.g., stand structures) every 10 years to the Services.

Incidental take authorization under ~~the Safe Harbor~~ Phase II does not take effect until confirmed by the Services or, in the event of any disagreement, until all parties complete the dispute resolution process as described under Section 14 of the IA. Furthermore, Phase II would not take effect until the dispute resolution process is completed under Section 14.2 of the IA to determine whether additional mitigation is necessary upon early termination. Nothing in this section precludes Plum Creek from conducting forest management activities while ~~Safe Harbor~~ Phase II availability is being determined or so long as such activities are otherwise in accordance with existing law. If at any time during ~~the Safe Harbor~~ Phase II, the Services determine, based on reliable, peer reviewed, technical information, that Plum Creek's continued use of a ~~Safe Harbor~~ Phase II incidental take authorization for a species will appreciably reduce the likelihood of the continued survival and recovery of such species, the Services may ~~suspend~~ terminate the ~~Safe Harbor~~ Phase II incidental take authorization for such species. P~~p~~ending any dispute resolution under Section 14 of the IA, the Services may suspend such incidental take authorization.

5.3.3.2 Baseline

Selection of Baseline Year - As described above, and except as specifically recorded below, if the 50-year Phase I is completed, the ~~Safe Harbor~~ Baseline will be the amount of habitat projected to exist at year 50 (i.e., 2045 if the Permit is issued in 1996) as described in this document, as the same may be amended

from time to time. ~~if the 50 -year HCP Phase I is completed.~~ In the event that ~~the HCP~~ Phase I is terminated early, the ~~Safe Harbor~~ Baseline would be either the amount of habitat projected to exist at year 2045 (expected ~~HCP~~ Phase I termination year) or the amount of habitat existing in year 1996 (time of Permit issuance), whichever is greater and provides the most habitat for that species or Lifeform. ~~Safe Harbor~~ Baselines will be calculated for each species affected, and habitat will be defined separately for each species, or groups of species pursuant to the Lifeform groupings.

Primary habitat, where such is differentiated for a given species or Lifeform, is the driving factor when comparing the amount of habitat in 1996 and 2045. In the event of early termination of Phase I, the amount of primary habitat will be used to determine whether the 1996 or 2045 Baseline applies.

For example, Lifeforms 9, 13a, and 14a have more suitable habitat projected for year 2045 than currently exists, but lesser amounts of primary habitat are projected for 2045 than currently exists. In the event of early termination, because primary habitat amounts determine the selection of Baseline year, the amounts of primary and suitable habitat available in 1996 would form the Baseline.

However, the determination of habitats available for harvest in Phase II will utilize both primary and suitable habitats as described below. In other words, both primary and suitable habitats must exceed the Phase II Baseline before Phase II would apply to a species.

Baseline Habitat Amounts - For the northern spotted owl, primary habitat is defined as NRF habitat, while ~~secondary habitat is~~ "suitable" owl habitat is ~~(i.e.,~~ NRF and FD~~)~~. In the event of early termination of ~~the HCP~~ Phase I, the amounts of primary habitat available for management and harvest during ~~the Safe Harbor~~ Phase II and under this ~~a Safe Harbor~~ provision would be those amounts of primary habitat that exceed the amount ~~available~~ in 1996 (i.e., 20 percent). This is because primary habitat is the driving factor when comparing ~~available~~ habitat amounts in 1996 and 2045. Therefore, the amount of suitable habitat comprising the ~~Safe Harbor~~ Baseline is equivalent to the 1996 amount as well (i.e., 40 percent). The use of primary and ~~secondary~~ suitable habitats would allow Plum Creek to substitute excess NRF habitat for deficiencies, if any, in FD. In the case of normal termination of ~~the HCP~~ Phase I at year 50, the amount of primary and ~~secondary~~ suitable habitat comprising the ~~Safe Harbor~~ Baseline is equivalent to such habitat amounts projected ~~at~~ for 2045.

For marbled murrelets, habitat is defined by the criteria delineated in Section 3.2.1.2. For Grizzly bears, habitat is, for the purposes of this section, the amount of security habitat as defined in Section 2.10.3.4. This is the combined total of foraging/prey, hiding/thermal, and non-forested habitats occurring in low road-density areas. This calculation of habitat would be completed for the portion of the I-90 Lakes Subunit which includes the Recovery Zone. Avoidance of prime habitats and provision of cover and escape opportunities as described in the applicable BMPs would continue during Phase II. For gray wolves, habitat is defined as the amount of security habitat found throughout the Planning Area. Other than the geographic area, wolf security habitat is defined in ~~the same way as~~ a similar manner to grizzly bear habitat. Wolf habitat is that amount of habitat which remains usable due to an absence of excessive road densities. Unless the most current scientific data indicate otherwise, useable habitat will be defined using the same road densities as were applied for grizzly bears in Phase I.

For all other ~~named and unnamed~~ species, whether listed now or listed within the next 100 years, habitat will be defined using the appropriate mix of stand structures which comprise the primary and suitable

habitats for the appropriate Lifeform. Stand structure amounts to be considered for these purposes are the minimum amounts (those amounts required during Phase I) that will occur on Plum Creek's lands only. These minimums reflect the flexibility provided Plum Creek to operate within a range for all of the stands structures. These minimums as they apply to ~~the Safe Harbor provision~~ Phase II, can be calculated by multiplying the values depicted for Plum Creek ownerships in Table ~~26~~ 30 by 90 percent. The reasoning for this calculation can be found in the explanation for stand-structure flexibility found in Section 5.3.5 **Amendments and Flexibility**. However, it should be recognized that Table ~~26~~ 30 depicts current projections for 1996 and 2045. It is expected that these values may be changed pursuant to the amendment provisions set forth in the IA. Current estimates and 1996 projections, as well as future projections, may be modified as a result of the intensive inventories to be conducted during the first 2 years of the HCP. ~~Safe Harbor~~ Phase II calculations would utilize the best estimates available and the most current projections. Criteria to be met in comparison to the baseline include suitable as well as primary habitats.

~~The most current stand structure projections for 1996 and 2045 would be combined as specified in Phase I for primary and secondary suitable habitat for each Lifeform. In the event of termination prior to the end of the full 50 -year HCP Phase I, the results for 1996 and 2045 would then be compared to determine which result provided the most habitat for that species and Lifeform. For example, in the event of early termination with no modification to the HCP, Lifeform 2 would have greater amounts of available habitat at year 2045. However, Lifeform 6 would have more habitat available at year 1996. In the event of termination of the HCP Phase I at year 2045, habitat available at year 2045 would be used to calculate baseline.~~

~~Two~~ Several exceptions to these methods exist. For Lifeform 5, habitat is defined based on edge habitat and requires GIS to calculate the amount of edge available. For the majority of species in Lifeform 5, road densities may play as important a role as amount of edge habitat, because high road densities sometime preclude the use of what otherwise would be usable habitat. Baselines for Lifeform 5 species will include road densities as a determining factor and will be determined prior to implementation of Phase II with regard to any such species.

With respect to fish species, the ~~Safe Harbor~~ Baseline includes those riparian habitat elements necessary for properly functioning fish habitat. Fish habitat will be determined as properly functioning based on the results of both watershed analysis and monitoring. The habitat benefits appropriate for ~~Safe harbor~~ reduction during Phase II, are those habitats that if removed, do not diminish the proper function of riparian and fish habitats. Like all aquatic, riparian, and wetland species; certain habitat treatments would continue throughout all portions of Phase II:

1) Most minimum and interim treatments would continue. Buffer widths for wetlands and riparian areas would remain as prescribed in Phase I. The amount of commercial timber removed during harvest would be no more than 50 percent from managed riparian areas provided the resulting stand would still provide FD habitat for owls. Other riparian and wetland buffers would only be harvested in accordance with the prescriptions found in Phase I. No-harvest and no-equipment zones would be maintained.

2) Watershed analysis prescriptions developed during Phase I would be followed during Phase II.

3) Stand structure projections for riparian and wetland search areas, as presented in Table 30, would form the baseline.

With respect to species which may be listed in the future, and which are inextricably linked to a particular special habitat or habitats (e.g., caves, talus, cliffs, wetlands) would not receive Phase II coverage unless the special habitat treatments specified in the HCP were continued through Phase II.

Baseline Minimization Efforts - In addition to the habitat provisions discussed above, steps will be taken to minimize the direct take and reproductive-season impacts upon listed species. For instance, harvesting or road building would not occur within a 0.25-mile radius of an active owl nest, goshawk nest, or occupied murrelet stand between March 1 and August 30. Wolf den sites would be protected as specified during Phase I. Eagle and peregrine falcon plans and protection measures specified in Phase I would continue in Phase II. Limited operations immediately adjacent to nesting and breeding sites which are necessary to avoid precluding successful nesting and breeding of listed species will be implemented during the breeding/rearing season. For most species, the time when young are less mobile and are limited to a given structure or geographic location is when they are most susceptible to direct impacts or abandonment. This type of protection would be afforded other species should they become listed. For example, should wolverines be listed, restrictions for wolverines would involve the type of seasonal protections provided gray wolves under Phase I but would not include the entire home range area that might otherwise need protection to ensure that incidental take would not occur. The Services would not preclude the modification of suitable habitat having only indirect effects outside the breeding season so long as required habitat levels are maintained. If an area is subject to two or more restrictions or take-minimization methods simultaneously, and if these restrictions would otherwise preclude economic operations in the Planning Area, Plum Creek may develop site-specific plans in conjunction with the Services which would minimize the risk of death or injury to a known member of a listed species to the maximum extent practicable while at the same time, allow economic operations to continue.

5.3.3.3 Impacts

Since no take of listed species would be authorized under Phase II, except to the extent habitat conditions exceeds the basline for a specific species, it is expected that the biological and physical conditions during Phase II should at a minimum mirror the conditions described for year 50. To invoke Phase II, Plum Creek would maintain habitats above the Baseline for the affected species. The worst-case scenario is that the voluntary contribution would be negligible; i.e., habitat amounts would be equal to those projected for year 50. Habitat conditions are expected to improve over the long-term for Federal lands in the Planning Area. However, for the purposes of this analysis, it is assumed that all such improvement would cease at year 50. Habitat amounts calculated by using the 90 percent factor across the board is also a worst-case scenario. With the exclusion of catastrophic events, the total amount of potential forested habitat should remain constant. Current levels of nonforested habitat (e.g., lakes, rock, and ice) comprise approximately 8 percent of the subject properties. Harvesting of mature stands would result in conversion to an earlier seral stage, but would not reduce the total acreage of habitats available. Therefore, actions taken by Plum Creek cannot reduce the habitats to 90 percent of projected levels for all forested stand structures simultaneously. However, Table 32 presents the amounts of habitat available to most Lifeforms, assuming a reduction to 90 percent was possible "across-the-board".

Should early termination occur, conditions must exceed year 1996 or 2045, which ever is greater, in order to utilize Phase II. Therefore, conditions depicted at year 2045 for each Phase II species would always be exceeded. The analyses presented in the HCP for Phase I as they pertain to years 1996 and 2045 are therefore incorporated herein by reference.

Phase II impacts are minimized and mitigated in several ways. First, actions conducted during Phase I would benefit a host of species. These benefits will be realized by unlisted as well as listed species and many currently unlisted species are expected to benefit from the actions occurring in Phase I. Second, the level of "take" expected is variable and dependent on the amounts of habitat voluntarily provided over time. Management decisions made by Plum Creek may result in habitat amounts which exceed the Baseline. The value derived from these habitats would depend on the amount by which they exceed the Baseline and the length of time those habitats are present. Maintenance of habitat above the Baseline is considered mitigation. The level of mitigation would depend on the amounts of habitat and the length of time over which they are provided. In the case of Phase II, the mitigation must, by its very nature, occur in advance of the take. Lastly, "direct take" and reproductive-season impacts would be avoided. Avoidance of these impacts should help substantially reduce the level of impact associated with Phase II.

Should additional habitat be present during the later stages of the Permit period, the incentive for Plum Creek, absent any special provisions, would be to reduce habitat to levels projected for the end of Phase I, particularly if Federal law at that time provides that habitat modification or disturbance may be a form of incidental take of listed species. Plum Creek believes that it is in the best interest of the Company and listed species to have a positive incentive to attract and maintain species and to improve wildlife habitat during and beyond Phase I of the HCP. For example, if Plum Creek exceeded the projections for NRF habitat prior to completion of Phase I, it would be allowed to maintain that habitat for some period of time without fear of additional Federal restrictions. In the absence of Phase II, Plum Creek would have to decide whether to harvest that habitat prior to the end of Phase I or risk foregoing those profits. It is in the best interest of the resources and the Company to provide the flexibility that Phase II offers. For these reasons, Phase II offers advantages beyond those of a 50-year Phase I.

As a further assurance that impacts would be minimal, several provisions exist. In the event of early termination, a comparative standard would be used to determine the baseline. This would result in a very high Baseline for most species. In the event of completion of Phase I, the Services' are provided an opportunity at year 40 for further analysis as to whether Phase II is warranted for the requested species. In addition, the Services retain the ability to invoke extraordinary circumstances at any time. Together, these provisions afford the Services assurance that impacts would be minimal and would be exceeded by the benefits accrued.

5.3.3.4 Alternatives

Plum Creek considered several alternatives to the "Safe Harbor" concept presented herein. A No-Axction scenario would mean that Plum Creek would be encouraged to harvest habitats which exceed the HCP projections as the end of Phase I was approached to minimize regulatory restrictions. Plum Creek wishes to avoid this type of disincentive to proper management and would prefer to have the option of providing additional habitat instead of liquidating habitat in fear of regulatory constraints. For this reason, Plum Creek did not choose the No-Action Alternative. Other alternatives considered were a 100-year Phase I, periodic renewal of the Permit, and consentual or unilateral Phase I extensions. The end result of these alternatives would likely be similar biologically; however, the Proposed Plan offers greater certainty to Plum Creek than alternatives involving review and revisions. The 100-year Phase I alternative was not chosen by Plum Creek because it believed 100 years was an excessive period of time for Phase I due to uncertainties of economic projections and operations (i.e., rotation ages).

Section 5.3.5 Amendments and Flexibility:
pgs. 382/384; fifth paragraph:

In another example, new information may disclose that dispersal habitat definitions for the northern spotted owl requires~~s~~ less or greater canopy cover than previously allotted. To better tie mitigation to the needs of species, minor modifications to the HCP might be allowed to incorporate new canopy cover objectives.

Section 5.4.2.2 Thresholds for Triggering Corrective Action:
pgs. 385/387; delete last line:
~~The "thresholds" also must be linked to administrative determinations by regulating agencies such as biological opinions required by the ESA.~~

Section 5.4.2.3 Analysis of Causative Actions:
pg. 386/388; first sentence; first paragraph:
Should biological conditions be determined to have deviated from those predicted or estimated in the HCP, additional analysis would ~~be necessary~~ conducted and discussed with the Services to determine if the deviation is caused by management actions taken in the HCP or by external factors independent of the HCP.

Section 5.4.3.1 Watershed Analysis:
pgs. 387/389; second sentence:
HCP standards and guidelines would be modified for individual watersheds as a result of scheduled watershed analysis. This would be accomplished through adaptive management. Modifications prescribed by watershed analysis would be implemented by Plum Creek.

Section 5.4.3.2 Spotted Owl Management Strategy
pgs. 387/389; second sentence:
Spotted owl monitoring would be directed at verifying the ~~occupancy of protected sites in high density spotted owl "cluster" areas, and further testing of the RSPF model in other landscapes supporting owls~~ assumptions of the RSPF model and effectiveness of spotted owl deferrals at selected owl sites. The RSPF model would also be tested in other landscapes supporting owls outside the Planning Area. Additionally, the model would evaluate the Planning Area using current habitat conditions to generate a revised estimate of spotted owl carrying capacity, and compared against current occupancy of ~~high density cluster areas, as determined from monitoring data~~ designated survey areas.

Section 6.0 Appendices:
Glossary
pg. 2; add the following:
Merchantable Timber: Harvested Timber with commercial value.

Section 7.0 References:
Add and/or change references as shown below:

Jeffrey, R. 1989. The band-tailed pigeon: distribution, effects of harvest regulations, mortality rates, and habitats, 1968-1979. Unpublished Rept. to Washington Dept. Wildlife, Olympia, Washington.
Sanderson, G.C. (Ed.) 1977. Management of migratory shore and upland game birds in North America, International Assoc. Fish and Wildlife Agencies. Washington, D.C.
~~Almack, J.A., W.L. Gaines, R.N. Naney, P.H. Morrison, J.R. Eby, G.F. Wooten, M.C. Snyder, S.H. Fitkin, and E.R. Garcia~~. USFWS. 1993, appended. North Cascades grizzly bear ecosystem evaluation: Final report to the Interagency Grizzly Bear Committee, Denver, Colorado. 156 pp.

REVISED or NEW HCP TABLES AND FIGURES

FIGURE 3. Green River Drainage

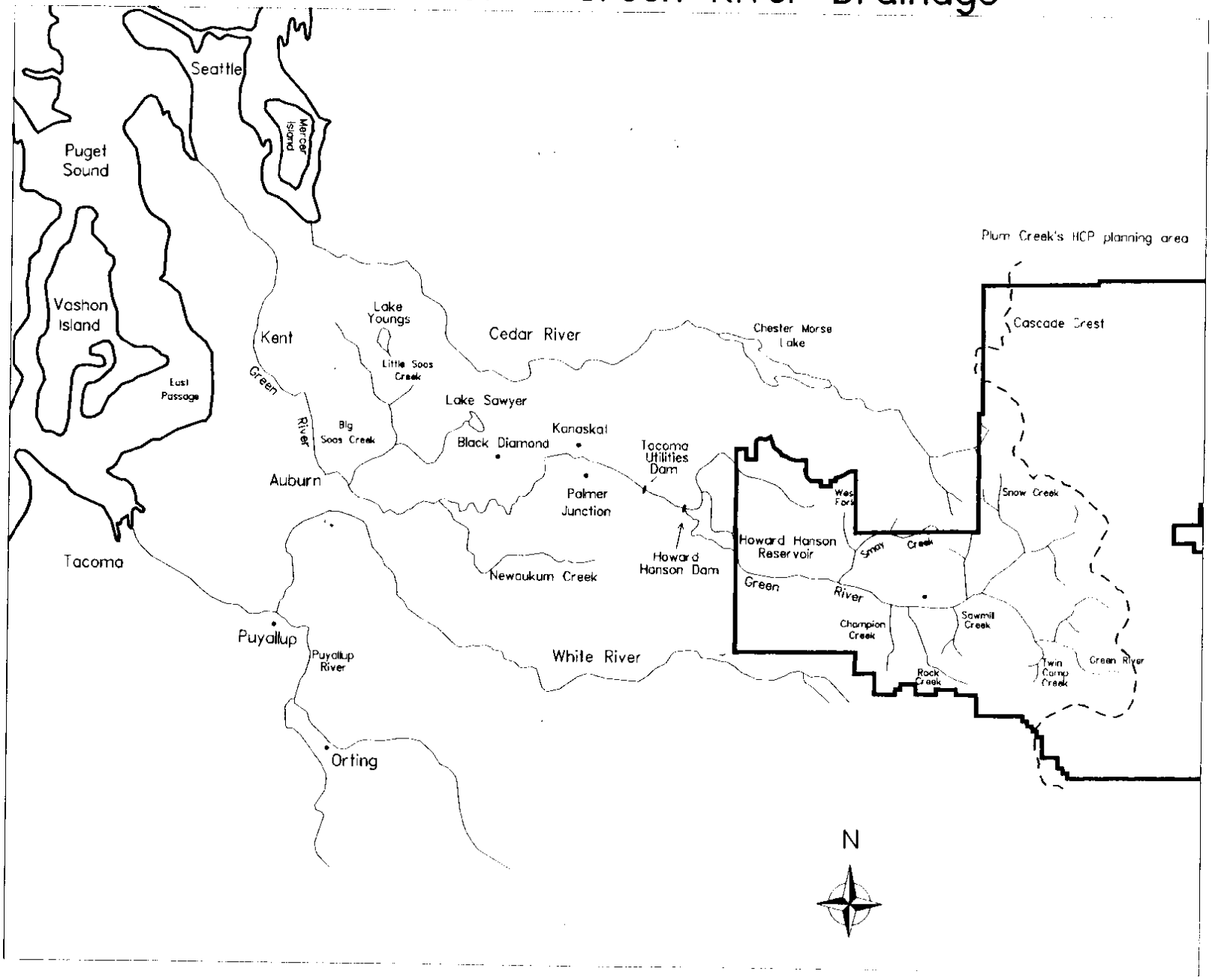


Table 26a. Summary of Watershed Processes and Resources Addressed by the Washington State Watershed Analysis Modules.

Watershed Analysis Module	Watershed Processes and Resources Addressed
Mass Wasting	• Debris Torrents • Landslides • Earthflows
Surface Erosion	• Hillslope Surface Erosion - Gullying - Dry Ravel - Sheetwash • Road Erosion
Hydrology	• Peak Streamflows • Summer Low Flows
Riparian Function	• Large Woody Debris Recruitment • Shade / Water Temperature • Bank Stability
Channel Condition	• Historic Channel Disturbance • Current Channel Condition • Spatial Distribution of Channel Response Types • Dominant Habitat Forming/Geomorphic Processes
Fish Habitat	• Distribution and Relative Abundance of Salmonid Fish • Existing Habitat Condition • Fish Habitat Utilization and Preferences
Water Supply / Public Works	• Location and Sensitivity of Water Supplies/Public Works - Public State Roads and Bridges - Reservoir, Irrigation Structures - Municipal, Domestic, Hatchery Water Supplies

Table 29. Grizzly bear habitat conditons estimated for security areas within the I-90 Lakes Subunit during the Permit period. Estimates shown are percentages of the security area in the entire subunit and on Plum Creek's land, by decade.

AREA	YEAR					
	1996	2006	2016	2026	2036	2045
Entire Subunit						
For/Prey	15	20	17	9	4	4
Hid/Therm	63	58	60	69	74	74
Plum Creek						
For/Prey	31	41	38	19	10	9
Hid/Term	50	41	43	62	72	73

NOTE: For/Prey - Foraging/Prey Habitat
Hid/Therm - Hiding/Thermal Habitat

Table 30a. Estimated percentage of each structural stage for the entire Planning Area, Riparian Habitat Areas (RHAs), and rocks and talus slopes, under the No-Action Alternative.

Habitat Area	1996		2006		2016		2026		2036		2045	
	PC[1]	HCP[2]	PC	HCP	PC	HCP	PC	HCP	PC	HCP	PC	HCP
HCP- Non[6]	8	12	8	12	8	12	8	12	8	12	8	12
SI	6	10	16	12	16	8	8	5	7	6	9	6
SS	5	2	4	4	4	4	2	1	3	1	1	1
YF	29	16	21	12	16	12	14	8	7	4	5	4
PT	9	7	19	11	28	18	30	22	26	18	20	13
DF	19	17	14	15	14	14	24	20	33	27	38	29
MF	19	23	14	21	10	19	10	19	12	19	15	21
MOG	4	7	3	6	3	6	3	4	3	5	3	5
OG	1	6	1	7	1	7	1	9	1	8	2	9
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100
RHAs[4]- Non	7	24	7	24	7	24	7	24	7	24	7	24
SI	3	6	2	4	2	1	1	0	1	1	1	1
SS	5	1	3	2	0	2	0	0	0	0	0	0
YF	26	9	21	8	10	6	2	1	0	0	0	0
PT	9	4	13	5	18	9	16	10	6	5	2	1
DF	13	12	14	13	19	14	27	17	33	21	30	20
MF	29	27	31	27	32	25	34	28	40	28	45	32
MOG	5	9	6	8	9	9	9	7	9	8	11	9
OG	3	8	3	9	3	10	4	13	4	13	4	13
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

Table 30a. Continued.

Habitat Area	1996		2006		2016		2026		2036		2045	
	PC[1]	HCP[2]	PC	HCP	PC	HCP	PC	HCP	PC	HCP	PC	HCP
TALUS[5]-Non	53	64	53	64	53	64	53	64	53	64	53	64
SI	3	2	14	7	17	9	13	6	7	3	2	1
SS	1	1	1	1	2	1	2	1	6	3	2	1
YF	3	2	3	2	6	3	12	5	3	2	9	4
PT	8	6	7	5	6	5	8	7	17	9	13	8
DF	23	13	15	11	9	8	7	8	8	9	14	11
MF	9	8	6	6	6	6	4	5	5	6	6	7
MOG	0	2	1	2	1	2	1	1	1	1	1	1
OG	0	2	0	2	0	2	0	3	0	3	0	3
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100

NOTES:

1 Percentage of ownership, Plum Creek

2 Percentage of all ownerships in the HCP Planning Area

3 Search area within entire HCP Planning Area

4 Search area within Riparian Habitat Areas and wetlands

5 Search area within Plum Creek's management units containing rock and talus slope areas;

6 Non = Non-habitat YF = Young Forest MF = Malure Forest
SI = Stand Initiation PT = Pole Timber MOG = Managed Old Growth
SS = Shrub/Sapling DF = Dispersal Forest OG = Old Growth

Table 30b. Total Acreage and Percentage of Forest Classes in the Planning Area by Stand Structural Stages for years 1996, 2016, and 2045.

Forest Class [1]	Acreage
DF-WH	88,399
NF-SF	67,286
NF/SF/SA	40,321
DF-GF	145,520
PP-LP	17,001
DECID	1,571
Non-forested	58,770
Total	**418,868**

Structural Stage [2]	Forest Class [1] DF-WH			NF-SF			NF/SF/SA		
	1996	2016	2045	1996	2016	2045	1996	2016	2045
SI	14 [3]	14	6	10	10	13	7	9	9
SS	1	3	1	8	7	1	7	6	2
YF	18	18	3	31	13	5	18	10	8
PT	10	24	23	7	31	15	9	19	5
DF	27	19	39	8	9	26	17	15	31
MF	20	14	19	21	18	27	23	21	24
MOG	1	1	1	2	2	1	13	12	5
OG	9	8	8	12	11	11	6	7	16

Structural Stage [2]	DF-GF			PP-LP			DECID		
	1996	2016	2045	1996	2016	2045	1996	2016	2045
SI	11	10	5	2	8	1	11	7	2
SS	0	2	1	<1	<1	<1	0	2	1
YF	15	16	3	3	1	2	5	11	4
PT	4	14	11	17	16	8	32	30	10
DF	20	16	35	25	22	35	39	30	58
MF	32	26	28	40	19	12	11	18	23
MOG	13	9	8	12	31	35	2	<1	<1
OG	4	7	10	<1	2	5	<1	1	1

[1] DF-WH = Douglas-fir / western hemlock
NF-SF = Noble fir / silver fir
NF/SF/SA = Noble fir / silver fir / subalpine fir
DF-GF = Douglas-fir / grand fir
PP-LP = Ponderosa pine / lodgepole pine
DECID = Deciduous

See descriptions on following page.

[2] SI = stand initiation
SS = shrub/sapling
YF = young forest
PT = pole timber
DF = dispersal forest
MF = mature forest
MOG = managed old-growth
OG = old-growth

[3] Structural stage percentages are based on the total acreage within each Forest Class.

Table 30b. Continued.

Descriptions of the Forest Classes (see Jensen 1995):

Douglas Fir - Western Hemlock (DF-WH): Forest stands of Douglas fir or western hemlock that occur on the west side of the Cascades. Other species such as grand fir, Engleman spruce, western larch, Sitka spruce, red cedar and western white pine are minor components in Douglas fir stands. Mountain hemlock is included here but normally inhabits elevation higher than is typical of this Forest Class.

Noble Fir - Silver Fir (NF-SF): Natural stands of dense silver fir and planted stands of noble fir that occur at higher elevations on the west side of the Cascades. Subalpine fir occurs as a minor component of this Forest Class.

Noble Fir - Silver Fir - Subalpine Fir (NF-SF-SA): Natural stands of dense silver fir and planted stands of noble fir that occur at higher elevations on the east side of the Cascades. Subalpine fir occurs as a minor component.

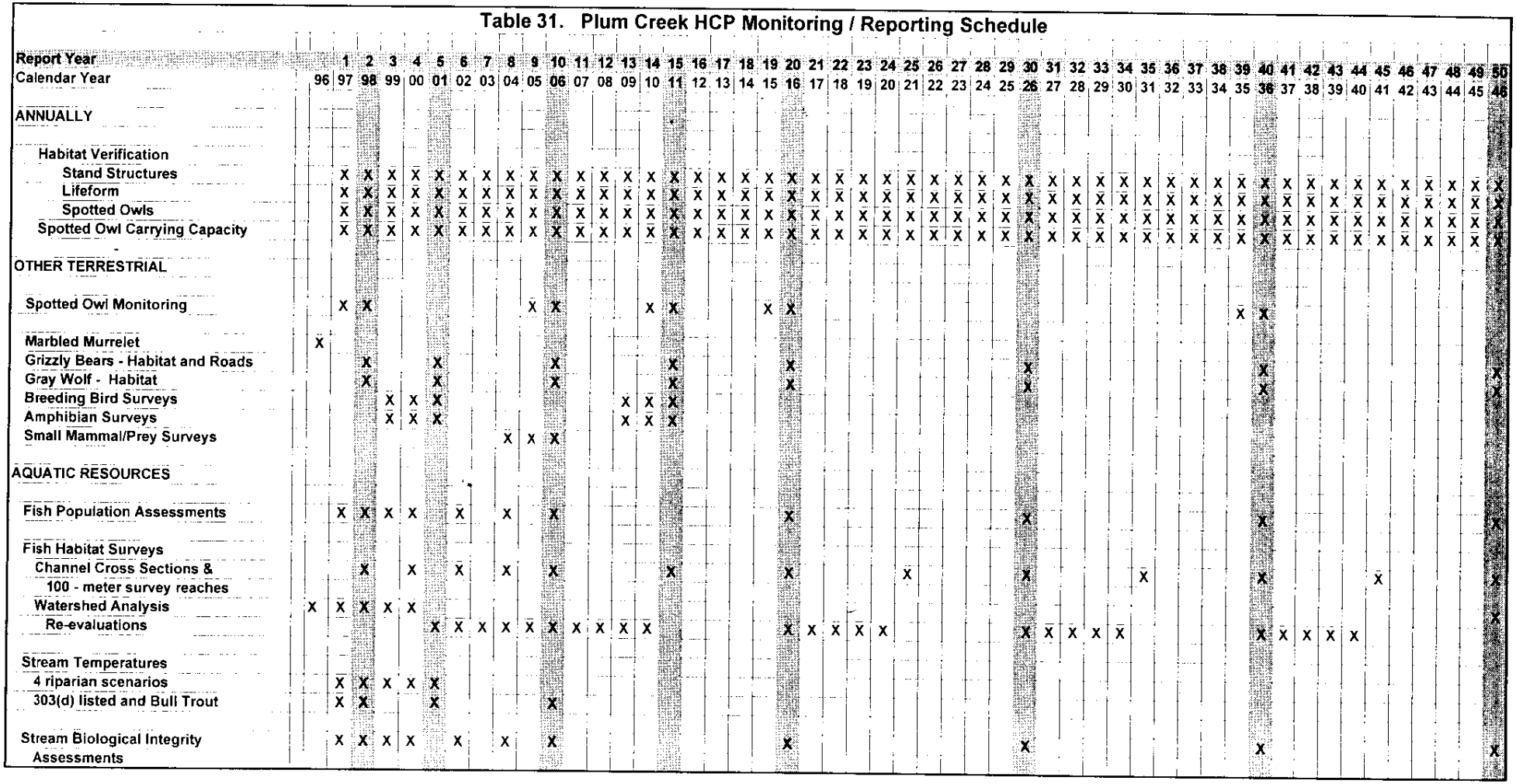
Douglas Fir - Grand Fir (DF-GF): Areas dominated by Douglas fir but with grand fir as a secondary species on the east side of the Cascades. This drier Forest Class is more susceptible to insect attack and fire. Western hemlock, Engleman spruce, Sitka spruce, western larch, red cedar, mountain hemlock, and western white pine may be included as minor components of stands or may be dominant in some stands. Soils and microclimate influence the distribution of tree species within this Forest Class.

Ponderosa Pine - Lodgepole Pine (PP-LP): Arid transition zone dominated by Ponderosa pine. Fire frequency is high but usually of low intensity.

Deciduous (DECID): Hardwood dominated stands that occur primarily in moist sites on the west side of the Cascades and in isolated pockets on the east side.

Non-forested: Areas that do not support commercial forests. They may be void of trees or unable to support a sustainable commercial forest crop (e.g., lakes, rock areas).

Table 31. Plum Creek HCP Monitoring / Reporting Schedule



7/31/96

Table 32. Estimated percentages of all ownerships in the Planning Area providing primary (P) and total suitable habitat (SH) for each lifeform at a **90 percent reduction of the levels projected for Implementation of the HCP.** Percentages are estimates and displayed by decade for the 50 year Permit period.

	YEAR											
	1996		2006		2016		2026		2036		2045	
Lifeform	P[1]	SH[2]	P	SH	P	SH	P	SH	P	SH	P	SH
2	55	64	56	65	57	66	62	68	68	71	72	73
3	55	64	56	65	57	66	62	68	68	71	72	73
4	32	34	27	31	24	30	24	30	28	32	30	33
5	not estimated		not estimated		not estimated		not estimated		not estimated		not estimated	
6	15	44	13	44	8	41	1	38	1	37	1	37
7	26	50	27	50	29	52	28	51	25	49	21	48
8	23	49	25	48	31	53	30	54	21	50	15	47
9	25	46	25	46	28	50	28	51	25	49	21	47
10	58	66	56	64	60	67	70	74	73	76	74	76
11	58	72	56	74	60	78	70	80	73	79	74	78
12	55	57	56	58	57	62	62	67	68	71	72	72
13	51	62	46	57	43	57	49	63	57	67	62	70
13A	35	43	33	47	30	51	30	54	32	55	35	56
14	51	68	46	65	43	64	49	66	57	71	62	73
14A	35	43	33	39	30	37	30	40	32	45	35	48
15 (early)	26[4]		27		24		14		11		10	
15 (middle)	22		24		29		39		41		39	
15 (late)	35		33		30		30		32		35	
16	55	64	56	65	57	66	62	68	68	71	72	73

[1] - Percentage of the HCP search area containing Primary Habitat
[2] - Percentage of the HCP search area containing Suitable Habitat = Primary Habitat + (Secondary Habitat/2)
[3] - Percentage of the HCP Planning Area within 0.5-miles of an "edge" between forage and cover habitats
[4] - Expresses the percentage of habitat in the HCP Planning Area containing early, middle, and late-aged forests.

Search Area: RHAs only (Lifeforms 1,2,3,6,7,9,12,16); Rocks and Talus (Lifeform 4); Entire Planning Area (Lifeforms 8,10,11,13,13a,14,14a,15).

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APPENDIX 5

Changes to the Implementation Agreement

The following modifications were made to reflect a change in terminology regarding Safe Harbor and other minor editing changes.

1.0 BACKGROUND INFORMATION

1.9 The HCP, Permit and this Agreement run concurrently for a period of fifty (50) years during Phase I ~~the HCP Phase~~. The HCP also addresses, the Permit provides and this Agreement implements, a Phase II ~~Safe Harbor~~ incidental take authorization as an additional incentive to Plum Creek to improve wildlife and fish habitat so that the HCP may yield benefits after Phase I ~~the HCP Phase~~ beyond those anticipated at the time this Agreement is executed. To the extent that habitat conditions exceed the Phase II ~~Safe Harbor~~ Baseline, the Permit would continue after Phase I ~~the HCP Phase~~ to authorize incidental take of certain Permit Species and Plan Species listed after Phase I ~~the HCP Phase~~ associated with that habitat during Phase II ~~the Safe Harbor Phase~~. In addition, Section 5.3.3 of the HCP and Sections 2.0, 7.0-8.0 and 11.0-16.0 of this Agreement remain in effect throughout Phase II ~~the Safe Harbor Phase~~.

1.10 The purpose of this Agreement is to implement the HCP on which the Permit is based; to contractually bind the parties to the terms of the HCP; to describe the remedies and recourse in the event of a breach of the terms hereof; to obtain assurances that, to the extent the ESA and this Agreement provide, the Permit will be amended to add any species dependent on the various habitat types analyzed in the HCP should such species be listed as threatened or endangered after the effective date of this Agreement; and to implement Phase II ~~the Safe Harbor Phase~~.

2.0 DEFINITIONS

2.5 The term "Extraordinary Circumstances" means a material change in circumstances or information that warrants revising a habitat conservation plan prepared under Section 10(a) of the ESA or a Phase II~~Safe Harbor~~ Baseline and requiring additional mitigation from the permittee to avoid appreciably reducing the likelihood of survival and recovery of the affected species in the wild.

~~**2.7** "HCP Phase" means the fifty (50) year period during which the HCP, Permit and this Agreement run concurrently unless sooner terminated under Section 11.0 of this Agreement.~~

2.8~~7~~ The terms "Peer Review" or "peer reviewed" mean that consistent with Section B(1) of the Interagency Cooperative Policy for Peer Review in Endangered Species Act Activities (59 Fed. Reg. 34,270), the Services will provide for peer review of the scientific data on

which the agencies base any finding requiring peer review in this Agreement to ensure that any such findings are based on the best scientific data available. In the event peer review of such data is not available in time to enable the Services to meet their obligations established by statute, regulation and this Agreement, the required finding or decision based on such data will be effective but may be subject to reconsideration by the Services as soon as that information becomes available.

Sections 2.9, and 2.10 become 2.8 and 2.9 respectively

2.10 " Phase I" means the fifty (50) year period during which the HCP, Permit and this Agreement run concurrently unless sooner terminated under Section 11.0 of this Agreement.

2.11 "Phase II" means that period of up to fifty (50) years after Phase I during which the Permit would continue to authorize certain incidental take of Permit Species and Plan Species that become listed after Phase I where to the extent habitat conditions exceed the Phase II Baseline for such species.

Sections 2.11, 2.12, and 2.13 become sections 2.12, 2.13, and 2.14 respectively

~~**2.145** "Safe Harbor" means the authorization of Plum Creek to incidentally take certain Permit Species and Plan Species listed after the HCP Phase I to the extent that habitat conditions exceed the Safe Harbor Baseline after Phase I the HCP Phase.~~

2.145 "~~Safe Harbor~~ Phase II Baseline" means those habitat conditions existing on lands within the Project Area as described in Section 5.3.3 of the HCP, as the same may be amended from time to time.

~~**2.15** "Safe Harbor Phase" means that period of up to fifty (50) years after the HCP Phase during which the Permit would continue to authorize certain incidental take of Permit Species and Plan Species that become listed after the HCP Phase where habitat conditions exceed the Safe Harbor Baseline for such species.~~

2.17 The term "Unforeseen Circumstances" means a change in circumstances or information that might give rise to the need to revise a habitat conservation plan prepared under Section 10(a) of the ESA or a ~~Safe Harbor~~ Phase II Baseline. The listing of any Plan Species or the designation of critical habitat are not Unforeseen Circumstances.

4.0 TERM

This Agreement, the HCP, and the Permit will remain in effect until fifty (50) years from the original date of issuance of the Permit unless sooner terminated under Section 11 of this Agreement. In addition, following written confirmation by the Services that the Phase II~~Safe Harbor~~ provisions of Section 12 of this Agreement are available, the Permit, Sections 5.3.3 of the HCP and Sections 2.0, 7.0-8.0 and 11.0-16.0 of this Agreement remain in effect during Phase II ~~the Safe Harbor Phase~~ II to authorize certain incidental take associated with activities within the Project Area as is more fully described in Section 12.0 of this Agreement.

5.0 FUNDING

As discussed in Sections 3.7 and 5.3.6 of the HCP, Plum Creek has sufficient financial resources to, and by this Agreement does commit to, fund its affirmative obligations under the HCP. To ensure notification of any material change in the financial ability of Plum Creek to discharge its obligations during the life of the Permit, Plum Creek will provide the Services with a copy of its annual report each year of the Permit or other reasonably available financial information as mutually agreeable.

7.0 AMENDMENT

7.3.2 Other Modifications

(a) Generally. Minor changes in the HCP may be initiated by written notice from Plum Creek or the Services. Such notice must contain a full description of the change and factual analysis that demonstrates the expected effect of the change on any Plan or Permit species or habitat types and the basis for the conclusion that the change is minor. Minor changes are deemed approved and become effective 60 days after receipt of written notice unless the responding party provides written disapproval of the proposed change or written notice that the proposed modification must be processed as an amendment under paragraph 7.3.1 of this Agreement. Minor changes under this paragraph include, but are not limited to, minor modifications to the mitigation program described in Section 5.3 of the HCP, changes by the Services in the Phase II~~Safe Harbor~~ Baseline in accordance with Section 12.3.2 of this Agreement, or any reporting requirements; correction of typographical, grammar, or editing errors in the HCP; and correction of any maps or exhibits to reflect previously approved changes in the HCP or other new information.

8.0 UNFORESEEN AND EXTRAORDINARY CIRCUMSTANCES

(c)(2) In determining whether Extraordinary Circumstances exist, the Services will consider, but not be limited to, the following factors: the size of the current range of the affected species; the percentage of the range adversely affected by the HCP; the percentage of range conserved by the HCP; the ecological significance of that portion of the range affected by the HCP; the level of knowledge about the affected species and the degree of specificity of the species' conservation program under the HCP; and whether the HCP was originally designed to provide an overall net benefit to the affected species and contained measurable criteria for assessing the biological success of the HCP."

(~~2~~ 3) *Change subsection numeration.*

~~(3) In the event the Services find that neither Federal action nor modification of the HCP are possible under the terms of subparagraph (c)(2) of this paragraph to avoid appreciably reducing the likelihood of survival and recovery of a Permit Species in the wild, this Agreement and Permit shall terminate with respect to that species pursuant to Section 11.~~

(4) If the Services make a finding of Extraordinary Circumstances, during the period necessary to determine whether additional mitigation can be provided on Federal land or to seek additional mitigation from Plum Creek if necessary, consistent with subparagraph (c)(3) of this paragraph, the parties will use their best efforts to avoid contributing to appreciably reducing the likelihood of the survival and recovery of the affected species.

9.0 FINDINGS

[The following findings will not become final until after opportunity for public comment on the HCP and related documents. They are included here for illustration only during the comment period.]

e. Other Measures

Any other measures set forth in the HCP and required by the Services as being necessary or appropriate for the purposes of the HCP will be fulfilled. The Services shall issue the Permit to Plum Creek ~~concurrent with the~~ upon execution of this Agreement.

11.0 TERMINATION ~~OF THE PERMIT~~

The Permit may be terminated by either the Services or Plum Creek in accordance with the Services' regulations in force on the date of such termination; however, in addition, Plum Creek reserves the right to terminate the Permit in accordance with regulations in effect at the time of Permit issuance, now codified at 50 C.F.R. §§ 13.26 and 220.31 (1994 ed.) and incorporated herein by reference. In the event Plum Creek elects to terminate the Permit before the end of ~~the HCP~~ Phase I, Plum Creek agrees to provide the Services with 90-days advance notice of the proposed termination and a termination report as described in Section 5 of the HCP. Early termination under this Section is subject to compliance with the Permit condition requiring that any past incidental take has been sufficiently mitigated by conservation measures under the HCP implemented by Plum Creek prior to termination. The Services agree that Plum Creek may invoke the dispute resolution procedures of Section 14.2 of this Agreement to pursue resolution of any technical disagreement concerning the necessity or amount of such additional mitigation.

Termination of the Permit with respect to any species would also automatically terminate this Agreement and the HCP with respect to such species. This Agreement and HCP may be terminated by any party with respect to any unlisted species, not covered by the Permit, for any material breach of this Agreement and HCP with respect to that species. Any termination under this Section is subject to and limited by the ~~Safe Harbor~~ Phase II provisions of Section 12.0 of this Agreement.

12.0 ~~SAFE HARBOR~~ PHASE II

12.1 General

The HCP has addressed, the Permit provides and this Agreement implements, additional incidental take authorization during Phase II ~~the Safe Harbor Phase~~. Pursuant to such authorization, Plum Creek may incidentally take certain Permit Species and Plan Species listed after Phase I ~~the HCP Phase~~ to the extent that habitat conditions for that species exceed the ~~Safe Harbor~~ Phase II Baseline described in Section 5.3.3 of the HCP on lands within the Project Area, subject to the conditions and criteria set forth below in this Section. In the event a ~~Safe Harbor~~ Phase II Baseline is established, the Permit, Section 5.3.3 of the HCP and Sections 7.0-8.0 and 11.0-16.0 of this Agreement remain effect throughout Phase II ~~the Safe Harbor Phase~~.

12.2 ~~Safe Harbor~~ Phase II Baseline

The baseline for purposes of ~~determining the Safe Harbor~~ at the end of ~~the HCP~~ Phase I shall be the ~~Safe Harbor~~ Phase II Baseline as defined in Section 2.15 of this Agreement.

12.3 ~~Safe Harbor~~ Phase II Procedures

12.3.1 Plum Creek Notice

In its 40-year report to the Services as required by Section 5 of the HCP, or as part of its 90-day advance notice for early termination under Section 11.0 of this Agreement, Plum Creek shall provide notice of any ~~Safe Harbor~~ Phase II incidental take authorization it anticipates may be available after Phase I ~~the HCP Phase~~. Plum Creek's notice shall include the technical data and analysis that Plum Creek has relied upon in determining the availability of a ~~Safe Harbor~~Phase II Baseline, what actions, if any, Plum Creek will take to minimize incidental take of known species pursuant to Section 12.6 and an explanation of the extent to which the habitat conditions ~~Safe Harbor~~ exceed~~s~~ the ~~Safe Harbor~~ Phase II Baseline for each Permit Species. Nothing in this Section precludes a subsequent notice by Plum Creek to the Services as part of any amendment pursuant to Section 7.0 of this Agreement initiated after the 40-year report.

12.3.2 Services' Response

(a) 40 Year Report. In response to any ~~Safe Harbor~~ Phase II notice in Plum Creek's 40-year report, or subsequent ~~Safe Harbor~~ Phase II notice, the Services will advise Plum Creek in writing within one (1) year with respect to notices given prior to the end of Phase I ~~the HCP Phase~~ and within 90 days with respect to notices given within Phase II ~~the Safe Harbor Phase~~ after receipt of such notice that, for each Permit Species,

(1) the Services confirm Plum Creek's ability to enter Phase II ~~Safe Harbor~~ so long as Plum Creek remains in compliance with the terms and conditions of the HCP throughout the remainder of Phase I ~~the HCP Phase~~; or

(2) the Services have determined, based on reliable, peer reviewed, technical information that the ~~Safe Harbor~~ Phase II Baseline requires adjustment to adequately protect such species prior to the exercise of any ~~Safe Harbor~~ Phase II

incidental take authorization In such a case, the Services will use the amendment procedures in Section 7.3.2 to effectuate the adjustment. Any disputes regarding the proposed adjustment will be resolved under the dispute resolution procedures in Section 14.0 of this Agreement; or

(3) the Services have determined, based on reliable, peer reviewed, technical information, that the ~~Safe Harbor~~ Phase II incidental take authorization is not available because such action would appreciably reduce the likelihood of the continued survival and recovery of such species in the wild.

(b) Early Termination. In the event that Plum Creek includes a ~~Safe Harbor~~ Phase II notice as part of its 90-day advance notice for early termination under Section 11.0 of this Agreement, the Services will advise Plum Creek in writing within 60 days after receipt of such notice that, for each Permit Species,

(1) the Services confirm Plum Creek's ability to enter Phase II~~Safe Harbor~~; or

(2) the Services have determined, based on reliable, peer reviewed, technical information, that the ~~Safe Harbor~~ Phase II incidental take authorization is not available because such action would appreciably reduce the likelihood of the continued survival and recovery of such species in the wild.

Safe Harbor Phase II incidental take authorization does not take effect until completion of any dispute resolution under Section 14.0 of this Agreement. Nothing in this Section should be construed to preclude Plum Creek forest management activities after Phase I ~~the HCP Phase~~ so long as such activities otherwise are in accordance with existing law.

12.4 ~~Safe Harbor~~ Phase II Monitoring

As provided in Section 5.3.3 of the HCP, Plum Creek will report the status of the ~~Safe Harbor~~ Phase II Baseline and minimization efforts accomplished during Phase II ~~the Safe Harbor Phase~~ every 10 years to the Services.

12.5 ~~Safe Harbor~~ Phase II Termination

At any time during Phase II ~~the Safe Harbor Phase~~ the Services determine, based on reliable, peer reviewed, technical information, that Plum Creek's continued exercise of a ~~Safe Harbor~~ Phase II incidental take authorization for a given species will appreciably reduce the likelihood of the continued survival and recovery of such species in the wild, it may terminate the ~~Safe Harbor~~ Phase II incidental take authorization for such species. While any dispute resolution under Section 14.0 of this Agreement is pending, the Services may suspend such incidental take authorization for that species.

12.6 Minimization of Incidental Take during ~~Safe Harbor~~ Phase II

Plum Creek will minimize the incidental take of species listed as of the date of this Agreement by undertaking the measures described in Section 5.3.3 of the HCP. ~~In order to minimize any incidental take that might occur during the Safe Harbor Phase, Plum Creek will design its forest management activities during the Safe Harbor Phase to the maximum extent practicable to avoid directly causing actual physical injury to or death of a known member of a listed species (e.g., through limited seasonal restrictions around known dens or nest sites of listed species which are reasonably necessary to avoid~~

~~precluding successful nesting and breeding; management outside of the breeding season or management conducted in such a manner as would only modify suitable habitat and thus have an indirect effect would not be precluded).~~ In order to minimize any incidental take of species listed and added to the Permit subsequent to the signing of this Agreement that might ocur during Phase II, Plum Creek will design and conduct is forest management activities during Phase II to the maximum extent practicable to avoid directly causing actual physical injury to or death of a known member of a listed species, as described in section 5.3.3 of the HCP. Plum Creek will also avoid unauthorized incidental take of other listed species (e.g. harvesting of Safe-Harbor owl habitat which may also be murrelet habitat for which there might not be Phase II ~~Safe Harbor~~ protection under the Permit). The Services will provide Plum Creek with guidance regarding the methods to avoid such direct physical injury or death. The parties acknowledge and agree that it is not the intent of the parties to require Plum Creek to either survey for the presence or absence of a listed species or to manage to avoid all incidental take of listed species, but rather to minimize such effects by limited operations during the breeding season for a given listed species in areas immediately adjacent to nesting and breeding sites. ~~For example, such restrictions might involve the type of seasonal protections provided gray wolves under the HCP or the habitat immediately surrounding spotted owl nest sites, but would not include the entire home range "circle" that might otherwise need protection to ensure that incidental take would not occur.~~ The parties further agree that if an area is subject to two or more seasonal restrictions or take-minimization methods simultaneously, and if these restrictions would otherwise preclude economic operations in the Project Area, then Plum Creek may develop site-specific plans in conjunction with the Services which would minimize the risk of death or injury to a known member of a listed species to the maximum extent practicable while at the same time, allow economic operations to continue. If the parties cannot agree upon the methods necessary to avoid or minimize directly causing actual physical injury or death to a known member of a listed species, then the parties will use the dispute resolution process set forth in Section 14 of this Agreement.

13.0 SUSPENSION, REVOCATION AND RE-INSTATEMENT

The procedures and criteria for suspension, revocation, and re-instatement of the Permit shall be in accordance with regulations in existence at the time such action is taken. If the Federal regulations that govern should be modified from those codified at 50 C.F.R. §§ ~~§~~ 13.26 to 13.29, and/or § 222.27, as of the date of original execution of this Agreement, the modified regulations will apply only to the extent the modifications were required by subsequent action of Congress or court order. Such procedures and criteria shall also apply to suspension, revocation and reinstatement of this Agreement and the HCP whether or not the species of concern is the subject of the Permit.

14.0 ALTERNATIVE DISPUTE RESOLUTION

Plum Creek and the Services recognize that disputes concerning implementation of, compliance with, or termination of the Permit, HCP or this Agreement may arise from time to time. It is the intention of the parties to use the alternative dispute resolution procedures in this Section and to work together in good faith to resolve all such issues.

However, at any time either party determines that circumstances warrant, they may utilize ~~any remedy at law or in equity available~~ any remedy provided in Section 15 of this Agreement without waiting to complete this informal dispute resolution process. The Services specifically reserve the right to use whatever enforcement powers and remedies are available by law or regulation, including but not limited to, suspension or revocation of the Permit.

15.0 REMEDIES

The parties to this Agreement shall have all remedies at law and in equity available to them except that no party shall be liable in damages to any party or other person for any breach of this Agreement, any performance or failure to perform a mandatory or discretionary obligation imposed by this Agreement, or any other cause of action arising from this Agreement.

16.0 MISCELLANEOUS PROVISIONS

16.2 Integration and Severability

This Agreement, together with the HCP and the Permit, constitute the entire agreement between the parties. If any provision of this Agreement is found invalid or unenforceable, all other provisions shall remain in effect to the extent they can be reasonably applied in the absence of such invalid or unenforceable provision. This Agreement supersedes any and all other Agreements, either oral or in writing between the parties hereto with respect to the subject matter hereof and contains all of the agreements among them with respect to said matters, and each party acknowledges that no representation, inducement, promise or agreement, oral or otherwise, has been made by any other party or anyone acting on behalf of any party which are not embodied herein.

16.4 Services' Authority

Nothing in this Agreement is intended to limit the authority or responsibility of the Services to invoke the penalties or otherwise fulfill their responsibilities under the ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligation and responsibility of the Services as agencies of the Federal government.

16.5 Appropriations

Implementation of this Agreement and the HCP by the Services is subject to the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The parties acknowledge that the Services will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

16.~~4~~ 6 Notice

APPENDIX 6

Services' Consultation with Affected and Interested Tribes

On March 26, 1996, the Services met with members and representatives of the affected and other interested Tribes and the Northwest Indian Fisheries Commission. The meeting was called to provide a further opportunity to consult with the Tribes regarding the concerns raised in their comments on the Incidental Take Permit process and this particular application. The meeting took place at the Muckleshoot Tribal Fisheries Center on the Muckleshoot Indian Reservation in Auburn, Washington. At least 70 Tribal members, technical staff, and representatives were invited. Attendees included Gilbert King George and Pete Gerry (Muckleshoot Fisheries and Wildlife Committee Chairs), Patrick Reynolds and Karen Walters (Muckleshoot Tribal Technical Staff), Isabel Tinoco (Muckleshoot Coordinator), Paul Kennard and Daryl Williams (Tulalip Tribal Technical Staff), Keith Wyman (Skagit Systems Cooperative), Jim Anderson, Bruce Davies, Janet Burcham, and Eric Schott (Northwest Indian Fisheries Commission), Martin Ereth (Skokomish Fisheries Biologist), Charlene Post (Squaxin Island Tribal Fisheries Policy), and others who may not have introduced themselves or joined the meeting in progress. The Puyallup Tribe of Indians and the Yakama Indian Nation were notified of the meeting.

At the meeting, Tribal members, their technical staff, and the Northwest Indian Fisheries Commission presented their comments on aspects of the proposed HCP that may affect resources of Tribal interest. Those individuals speaking on behalf of the Tribes had the opportunity to readdress comments previously provided by the Tribes, prior to and during the first NEPA public review period.

All comments raised previous to this meeting have been addressed elsewhere in this FEIS. Some of these have generated changes to all of the documents comprising the application package. At this meeting, two thematic criticisms were shared by the commentors. First, as was stated by Patrick Reynolds, the commentors remain unconvinced that the HCP's riparian protection prescriptions provide any increment of protection over Washington State's Forest Practices Rules and Regulations. Second, the commentors are discomfited by perceived limits on the ability to raise during the Permit period, concerns that the provided measures are not working. A related concern was their desire for involvement in the monitoring program and any subsequent adaptive management.

On the first criticism, Matt Longenbaugh, representing NMFS, provided a "side to side" comparison of what the Plan provides in comparison to the State Forest Practices Rules and Regulations. Previously, this comparison was presented in DEIS Table 1 (page S-9), which is incorporated, largely unchanged, in the FEIS. In summary, State Forest Practices Rules and Regulations for fish-bearing streams require 25-100 foot riparian management areas (depending on stream width and fish numbers) in which aggressive timber harvest is permitted

and only a few streamside trees are retained for shade and future wood recruitment to the channel. Nonfish-bearing streams require 0-25 foot riparian management areas, in which trees must be retained only where necessary to protect resources. Intermittent, nonfish-bearing streams receive no protection.

By contrast, the HCP proposes 200 foot wide managed buffers for fish-bearing streams. In these buffers, the first 30 feet are no-harvest zones. The outer 170 feet are available for a single selective harvest during the Permit period which must leave at least 50 percent of the available volume and maintain 55-70 percent of the canopy. Trees along all perennial streams (fish and nonfish-bearing) would be managed within the managed buffers to grow into late-seral forest dominated by large-sized conifers. The formula for retention provides the Applicant with an incentive to leave larger trees. Nonfish-bearing perennial streams on the eastside of the Cascades would receive 100 foot buffers containing 30-foot equipment exclusion zones closest to the stream. In addition, even the smallest intermittent streams would receive some protection where the threat of erosion is identified through field reviews of unstable slopes.

By committing to do watershed analysis over the entire Planning Area, the Applicant will greatly improve the site-specific level of riparian and overall watershed protection, compared to the unknown number of watershed analyses that would be otherwise done, over the life of the Plan, by a variety of groups.

Tribal comments have resulted in changes to the Proposed Plan affecting these resources. For example, the FEIS reflects changes in the proposed riparian management strategy for Washington “Type 4" streams, on pages 16-17. Nevertheless, the meeting made clear there exists a divergence of opinion as to the extent of benefit provided in the proposed HCP compared to proceeding under State Forest Practices Rules and Regulations. The Services, based on the examination of the literature (e.g. McDade et al. 1990), are satisfied that the riparian prescriptions in the proposed HCP make the necessary contribution for fully functioning riparian areas.

Second, Reynolds stated the Tribes desire continued input and greater participation in the HCP process and question how that would be affected by provisions of the agreement between the Services and the Applicant. The Services and Applicant agreed that a position on each watershed analysis team would be reserved for a Tribal fisheries biologist or other representative from WDFW, USFWS, or NMFS. Nonetheless, Reynolds and Walters articulated their concern that based on the pace of watershed analysis proposed in the HCP, they did not have the means to adequately represent the Muckleshoot Indian Tribe in this continuing process.

The Services have sought to assist the Tribes in this regard by entering into a cooperative agreement with the Northwest Indian Fisheries Commission. By entering into this agreement, the Services have facilitated the coverage of Tribal concerns and inclusion of Tribal technical expert assistance in preparing and implementing HCPs. Additionally, other means of possible support from other sources and agencies could also provide assistance to the ability of the affected Tribes to participate in watershed analysis teams. Finally, participants at the meeting

agreed that a foundation exists for continuing consultation on issues that arise in the HCP process that affect Tribal interests.

After the March 26, 1996 consultation, Bruce Davies of the Northwest Indian Fisheries Commission submitted a memorandum to Tim Bodurtha, the HCP Program Supervisor. The memo was entitled "Additional Ideas on the Plum Creek HCP." Davies presented two concepts that he suggested could be included in the Plum Creek HCP: 1) that HCPs be encouraged as adaptive management experiments; and 2) that the Trust responsibility should require additional mitigation over time as part of the adaptive management process.

The HCP does contain an active adaptive management component which it recognizes as both a "management experiment" and also an active prescription that will help the HCP meet its stated objectives. The Adaptive Management described in the HCP identifies components in the HCP where adaptive management can be applied. Areas identified as opportunities for adaptive management include the proposed riparian management strategy and watershed analysis, among other things. The primary process described is one used to improve management practices by learning from experience.

The process is designed to establish research based on the monitoring of practices proposed in the HCP. Thresholds triggering corrective action are related to the goals of those practices. Where goals are not being met, the Services and Applicant would examine causative actions and modify management and mitigation elements. The timing of the described feedback "loops" would coincide with the HCP reporting cycle that occurs continually throughout the Permit period.

Nothing in the proposed HCP, ITP, or IA would be intended to limit the Services' Trust responsibilities to Indian tribes. As a result of the proposed integration of adaptive management to address HCP prescriptive activities into the future, the Services believe the tools are in place to continually address the proposed protective strategies for both fish and wildlife resources. The Services agree with the Northwest Indian Fisheries Commission that the flexibility needed in long term planning efforts is provided, in part, by the use of adaptive management.